

Andrew Baker

3D Character & Concept Artist

Gallery Artist

Gallery - 10 of the best images
from around the world!

Totem

Project Overview
by John Thiry

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BEASTS DROIDS & HUMANS

This month's interview comes from the master of beasts design **Andrew Baker**, **Jack Zhang** builds us a fighter droid and **Anto Juricic** and **Rodrigue Pralier** tackle the unwrapping stage of our **Character Production** series.

Cover image by Andrew Baker



Armored Cat

Christopher Brändström brings us the final installment of our **Armored Beasts** series by showing us how he created his excellent Armored Cat.



Guide to FX - Particles & Dynamics

Goodness gracious great tutorials on fire! This issue **Matt Chandler** (3dsmax) and **Mike Zugschwert** (Maya) show us how to create and animate fire.



Fighter Droid

Jack Zhang turns a 2D concept into a lean mean fighting machine with the construction of a Fighter Droid for our **Building Droids** series.



EDITORIAL

Hello and welcome to the June issue of 3DCreative. As the weather is hotting up this month, so are our tutorial series!

Our stunning cover has been created by Andrew Baker. We are lucky enough to be able to bring you a great interview with this impressive 3D character and concept

artist, who talks to us about how he found a home at Weta Digital, how he creates his stunning images and what it's like working on one of the most eagerly anticipated films of year: The Hobbit.

This month we see our two fantastic artists tackle the unwrapping stage of the character production series, which focuses on the modeling of an old man's head. Now they have covered the creation and the detailing of the head models, Rodrigue Pralier shows us how to prepare the model for texturing in 3ds Max, whilst Anto Juric presents the same process in Maya.

Continuing our tutorial series covering FX, Particles and dynamics, Matt Chandler and Mike Zugschwert show there's no smoke without fire as they talk us through how to create realistic flames. With Matt working in 3ds Max and Mike in Maya, they demonstrate how to develop these simple particle setups to include emitters and burning fuel sources.

Moving onto the third installment of our Building Droids series, Jack Zhang takes the 2D concept and technical drawings we provided him with and shows us how to build an accurate 3D model of a fighter droid.

Christopher Brändström brings our Armored Beasts series to a close this month. In our final chapter Chris shows us how to create an armored cat by creating a basic concept process in ZBrush and composition in Photoshop, whilst throwing in some helpful pointers.

We also have a Making Of from John Thiry, where he shows us the production of his image Totem, which you may remember from the March issue's gallery. Speaking of the gallery, we round things off by having another great selection of images from the likes of Francesc Camos, Marcus Dublin, Eve Berthelette and many more to keep you going until next time!

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Project Overview by John Thiry

FREE CHAPTER

Digital Art Masters: Volume 6 - Andrzej Sykut

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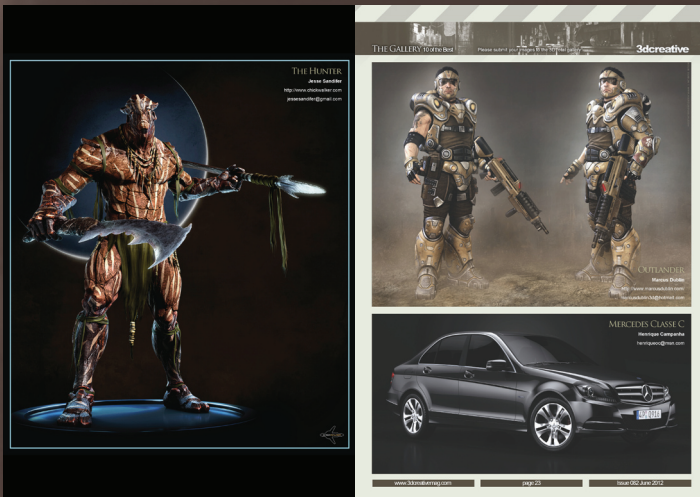
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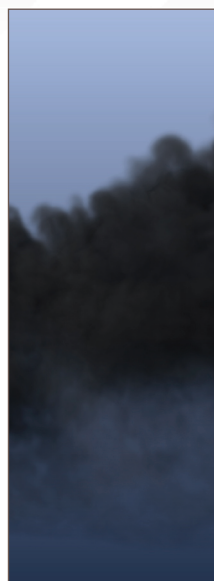
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CONTRIBUTING ARTISTS

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in the 3DCreative magazine, please contact: simon@3dtotal.com



MIKE ZUGSCHWERT

Mike Zugschwert is an FX Artist who works in Realflow, Maya, and 3DS Max. He was the Lead FX Artist for the short film Azureus Rising and now applies his talents to television commercials. He is currently working at Make in Minneapolis, MN.
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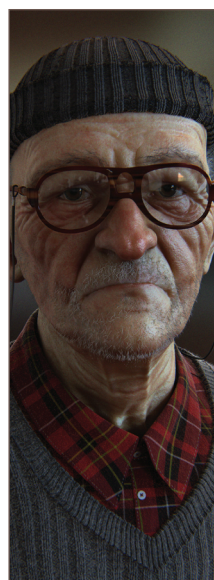


RODRIGUE PRALIER

Rodrigue Pralier is the lead Character artist at Bioware Montreal Quebec. After working in the games industry for nearly a decade

he has recently shipped the highly anticipated game Mass Effect 3 and has previously worked on other games like Army Of Two:40th day.

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ANTO JURICIC

Anto Juricic Toni is a character artist and he currently lives in Bosnia and Herzegovina, where he works at Primetime

Studio as a modeler and texture artist on animated features. Along with his passion for creating CG characters he also enjoys teaching others and sharing his techniques through many online tutorials and publications.

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CHRISTOPHER BRÄNDSTRÖM

Christopher Brändström is currently working as a fulltime freelance character/creature artist in the movie,

commercial and game industry. He's worked with games for over 10 years and has recently got back from London where he worked as a concept artist for Framestore Art Department on several feature films and commercials.

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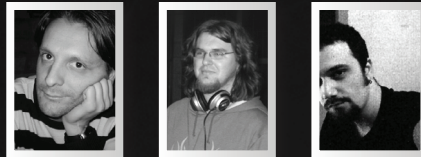
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THROUGH AND
CAPTURE WITH HIS/HER
CAMERA, SO ALWAYS
MAKE SURE YOU HAVE
THAT CAMERA
TO HAND!"

ANDREW BAKER

This month's interview is with the brilliantly talented character and concept artist Andrew Baker. He talks to us about making the most of the 2D and 3D worlds, grabbing inspiration from his travels, and the incredible journey he has taken with his work on *The Hobbit* films.

Hi Andrew, we have chatted a few times in the past about different projects and the kind of work that you do, but for the benefit of the readers can you tell us a little about how you became interested in art and how you ended up working for the really amazing Weta?

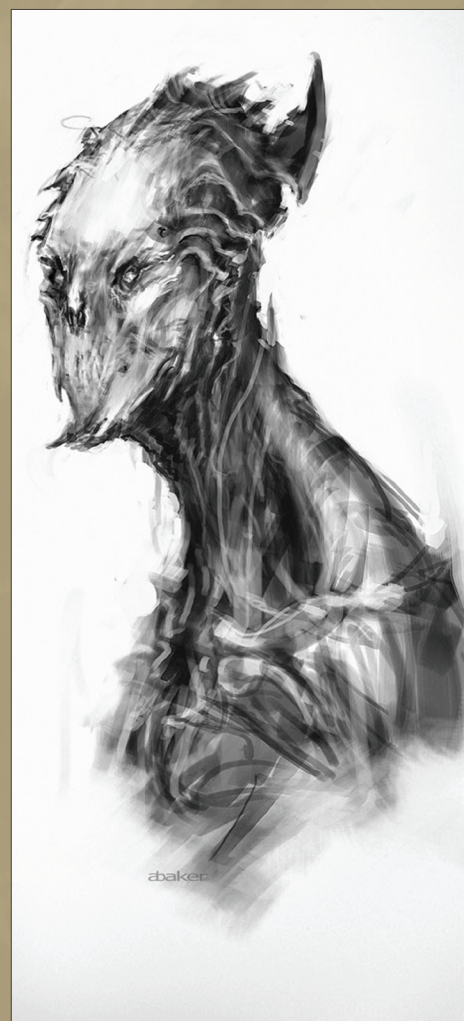
Well, I'd have to say it all began when I was a child and used to watch my father painting. I was fascinated by how he used paints to create these life-like images. Growing up in South Africa, with so much wildlife around me, led me to have a fascination with creatures as well. I collected spiders and scorpions when I was young and just love natural history.

It was definitely *The Lord of the Rings* films that whet my appetite and made me want to become a commercial artist, doing some sort of digital illustration or design. The life-like nature of all the creatures you see in that trilogy, such as Shelob, Gollum and the Balrog, got me so excited as I'd never seen anything so life-like on screen before. I knew then that I wanted to create creatures of that level, and it seemed CG and 3D software were up-and-coming areas and ones worth learning more about.

I put myself through Design College and went on to get my honors degree at Wanganui School of Design, here in New Zealand. During that time I taught myself ZBrush, LightWave and then Maya, and began learning about how to model, texture, light and shade characters and creatures. Once I'd graduated I worked as a freelancer for a while and, as most people in this industry do, I applied to Weta Digital. After a year or so of freelancing, I got a job as a pre-visualization artist for *The Adventures of Tintin: The Secret of the Unicorn*, which I did for about six months.

"AS LUCK WOULD HAVE IT, THE HOBBIT WAS MY FIRST TEST!"

I was then lucky enough to have a sample of my work shown to Sir Richard Taylor, who was very keen to get me going at the workshop as a creature and character designer, trying to push

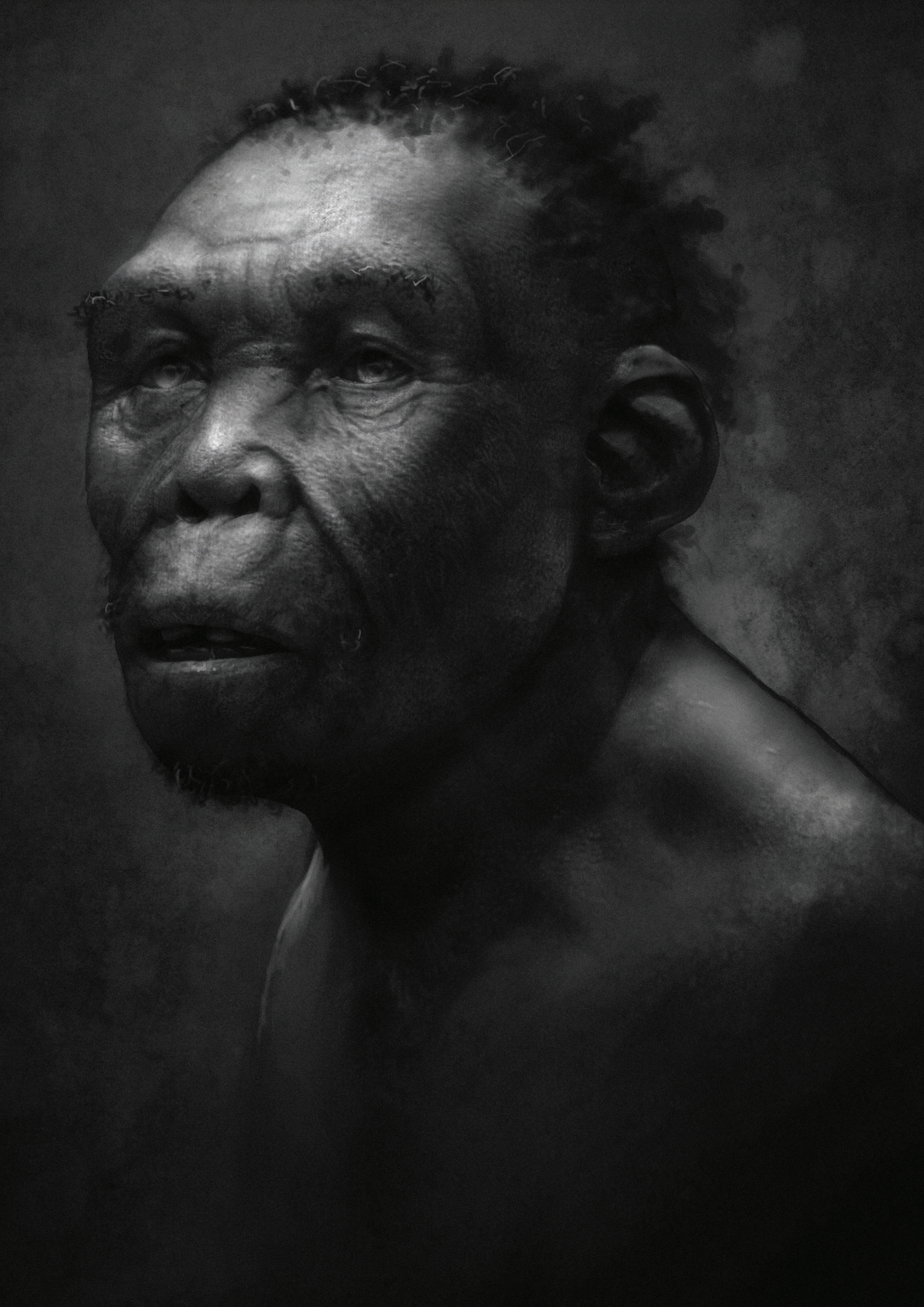


this medium into the concept art world and also fine art. As luck would have it, *The Hobbit* was my first test!

“As luck would have it, *The Hobbit* was my first test” – wow, I bet you never thought you’d hear yourself say those words! If you could choose a favorite character or creature from *The Lord of the Rings*, which one would it be? Mine would be the Balrog. That scene leaves me with my jaw on the floor every time I see it!

The Balrog was definitely one of them! The scale of that creature and the elemental feel was unlike anything I’d seen in a movie. The realism achieved in Gollum was also hugely inspiring for me.





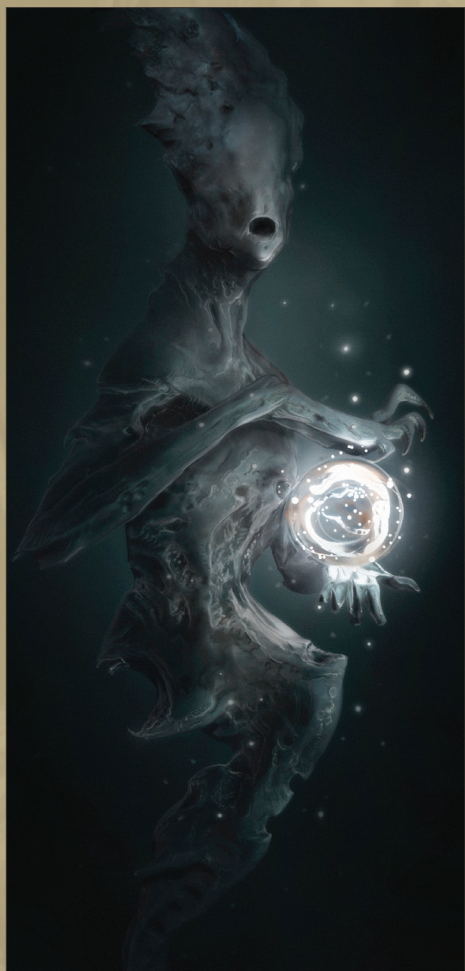


It sounds like you have traveled a long way and experienced a lot of different things during your creative career. Does traveling affect your art at all? Do you find you are influenced by the things you see around you in the different places you visit?

Absolutely! Different cultures and countries fascinate me and I always try to fuse my characters and creatures with a sense of where they might have come from and what they do. The world is a hugely inspiring place for an artist to wander through and capture with his/her camera, so always make sure you have that camera to hand!

“TECHNOLOGY HAS BEEN REALLY LIBERATING FOR ME AS AN ARTIST”

Moving on to your art itself, can you tell our readers a little bit about how you use ZBrush to create your stunning creature concepts? And what are your thoughts on ZBrush as a



modeling software package in general and the way the approach to character creation is evolving?

Thank you for calling them stunning. I remember hearing about ZBrush when version 2 came out. It got me very excited with what you could do, as 3D software at the time had been very technical and less conceptual. ZBrush was a big game changer; with some of the new features now, the sky is the limit and you don't really need all that much time to create a really nice sculpture, or even a scene. I marvelled a lot at the techniques of Aaron Sims, who was somewhat of a pioneer for this kind of artwork.

There are so many different ways to use the software available these days that it's great to see digital imagery being considered as art now and not just photo compositing. The ability to sculpt a character in ZBrush, light it, create props, background, color/texture them, take it into Photoshop and put in the final touches... It's like being the writer, actor and director of your own play. You're in control of everything from initial concept to the final render. Technology has been really liberating for me as an artist.



We're so used to grouping art into either 2D or 3D, whereas your work seems to bridge the gap a little. Would you consider yourself a 3D artist or a concept artist who makes the most of both worlds?

A concept artist that makes the most of both, I would say. Generally some digital artists are true to either 3D or 2D, but the software used to create either are just tools and I find that some exciting results can happen when you use both to create an image. Sometimes I use Photoshop to paint over a sculpture to visualize where I might take it next and even when the end result is 3D, I still use 2D to solve some issues. Whatever gets you there faster and with the best result!

"I HAVE BEEN WORKING ON THE HOBBIT SINCE THE BEGINNING AND IT HAS BEEN A VERY LONG, BUT EXCITING, JOURNEY. WE HAVE BEEN 'THERE AND BACK AGAIN', YOU COULD SAY"

You mentioned earlier that you're currently hard at work on one of this year's most anticipated films: *The Hobbit*. I know you probably can't tell us a great deal about it, but what has your involvement been and how long does an epic project like this take to complete?

Wow, that's a big question! I have been working on *The Hobbit* since the beginning and it has been a very long, but exciting, journey. We have been "there and back again", you could say. It's the first film I designed on and I have



been privileged to be involved with pretty much all the creatures, ethereal beings and some of the characters. This film really has it all and a number of talented designers contributed to the amazing wealth of visual information this story has. John Howe and Alan Lee are always inspiring to work with as well, and a bit of a dream come true for me. Perhaps once the film is out, we could do a *Hobbit*-focused interview with more details!

I'll hold you to that! Now, John Howe and Alan Lee are colossal names from the film industry and are amazing artists. As their traditional approach is far removed from your mix of 3D and Photoshop, how do they react to your art?

They absolutely hate me! [Laughs] No, they react very respectfully in my experience. Alan leaned forward in a meeting once and commented on how nice he thought a particular

image was that I'd done. I'll never forget how I suddenly lost the power of speech and all that came out of my mouth was a load of nonsensical words! But I think both of them embrace digital art and have started using Photoshop in their illustrations on *The Hobbit* as well. And yes, they are amazing!

I have spoken to a few guys that work over at Weta before and a lot of them seem to have huge personalities (Greg Broadmore springs to mind). Is it a fun place to work and do you get to spend much time to interact with the other artists?

Yes, it definitely is. We often work together on projects so a fair bit of interaction happens, especially when we're refining something down to a finish. It can often be a couple of artists that take it there to the end and you end up working quite closely with some of the team. But we're all a little crazy in some way and it leads to a very interesting workplace with a lot of diversity!

When you're not working on blockbuster movies, what do you like to spend your time doing? Do you think it's important to find the time to unwind while you're working on such high-pressure projects?

It is very important to unwind when you do this for a living! My partner, Lindsey Crummett, is a super-talented artist at Weta as well, so both of us have to remind each other to take a break from it when it gets serious. We've got an awesome dog that forces us to get out for runs and walks; she also reminds you not to take it all too seriously! I also play guitar, which is hugely relaxing, but sadly not so relaxing on the old hands! But they get over it quickly [Laughs]. I definitely make sure I'm not stuck to a desk 24/7 and that I get out and about.

Thanks for finding time to talk to us. It has been great to catch up and to be able to take a good look at some of your awesome work. Thank you so much for the interview and I look forward to sharing more with you as I go. This is just the beginning!



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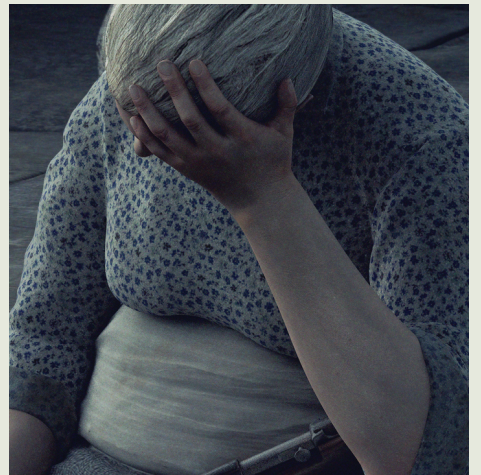
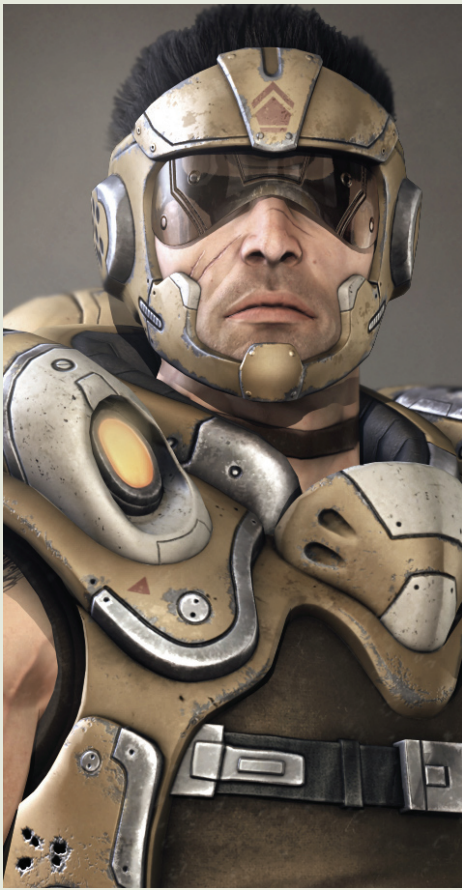
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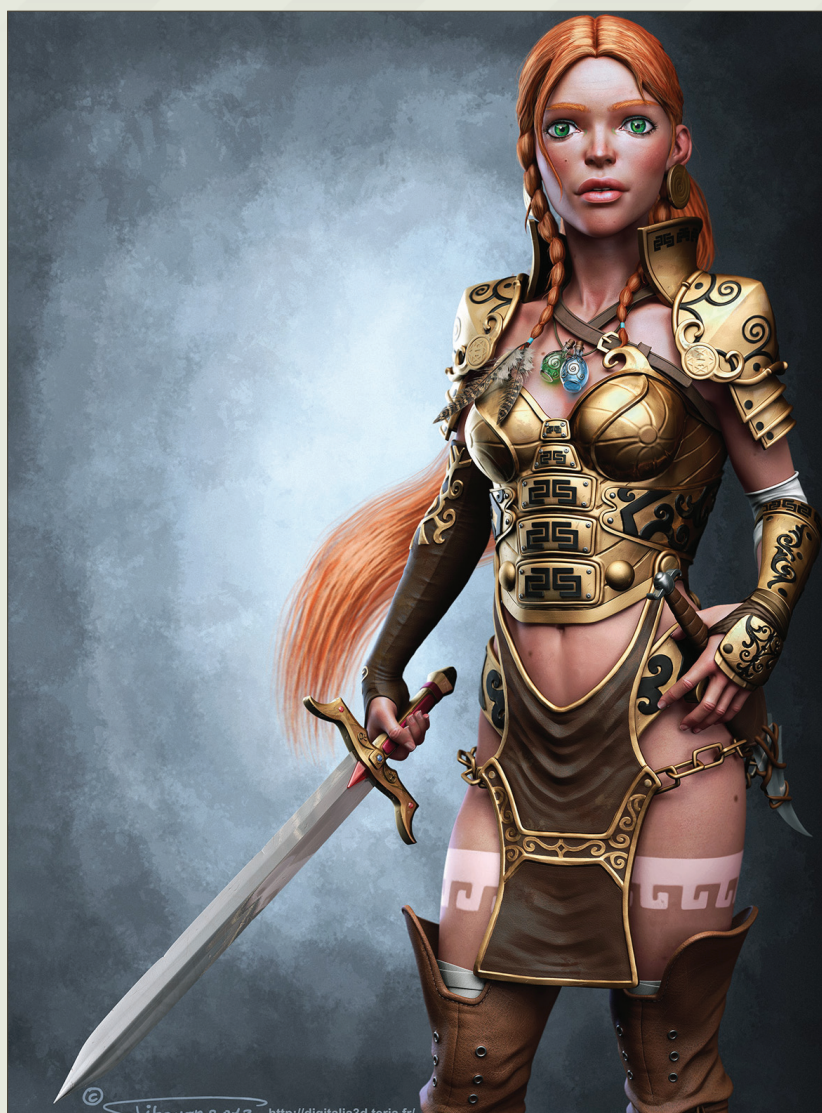
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Marcus Dublin | Rouhollah Toghyani | Francesc Camos | Veprikov | Jesse Sandifer | Alexandr Novitskiy

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GUIDE TO FX - **PARTICLES & DYNAMICS**

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3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.



CHAPTER 03 **FIRE**



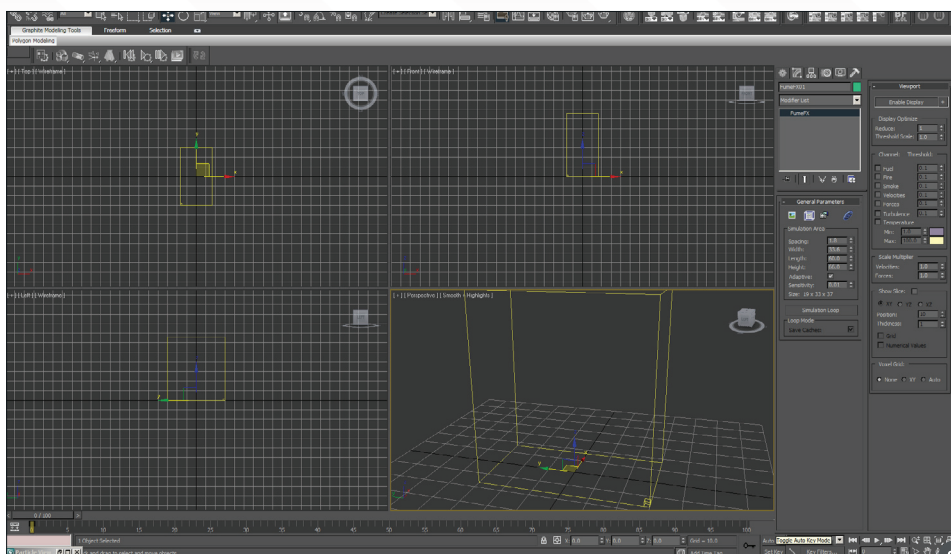
3ds max

CHAPTER 03 – FIRE

Software used: 3ds Max

Fluid simulation software and solvers have rapidly developed over the last few years. Simulation times have been reduced by improving hardware, which means that it's almost standard and expected to use a fluid solver for an effect as complex, subtle or explosive as flames. Like the previous smoke-themed tutorial, we will use FumeFX within 3ds Max to create some rolling, realistic flames. Fume is a powerful plugin that is capable of simulating huge, large-scale fire and smoke phenomena, or something as simple as a single candle flame.

Create a new 3ds Max scene and set Frame Rate to Film or your preferred FPS. Increase Scene Duration to 500 frames in length. Create a FumeFX container by clicking and dragging after you have selected it from the drop down menu list. The 3ds Max scene units are usually set to Generic, so to start with you should adjust these to Metric.



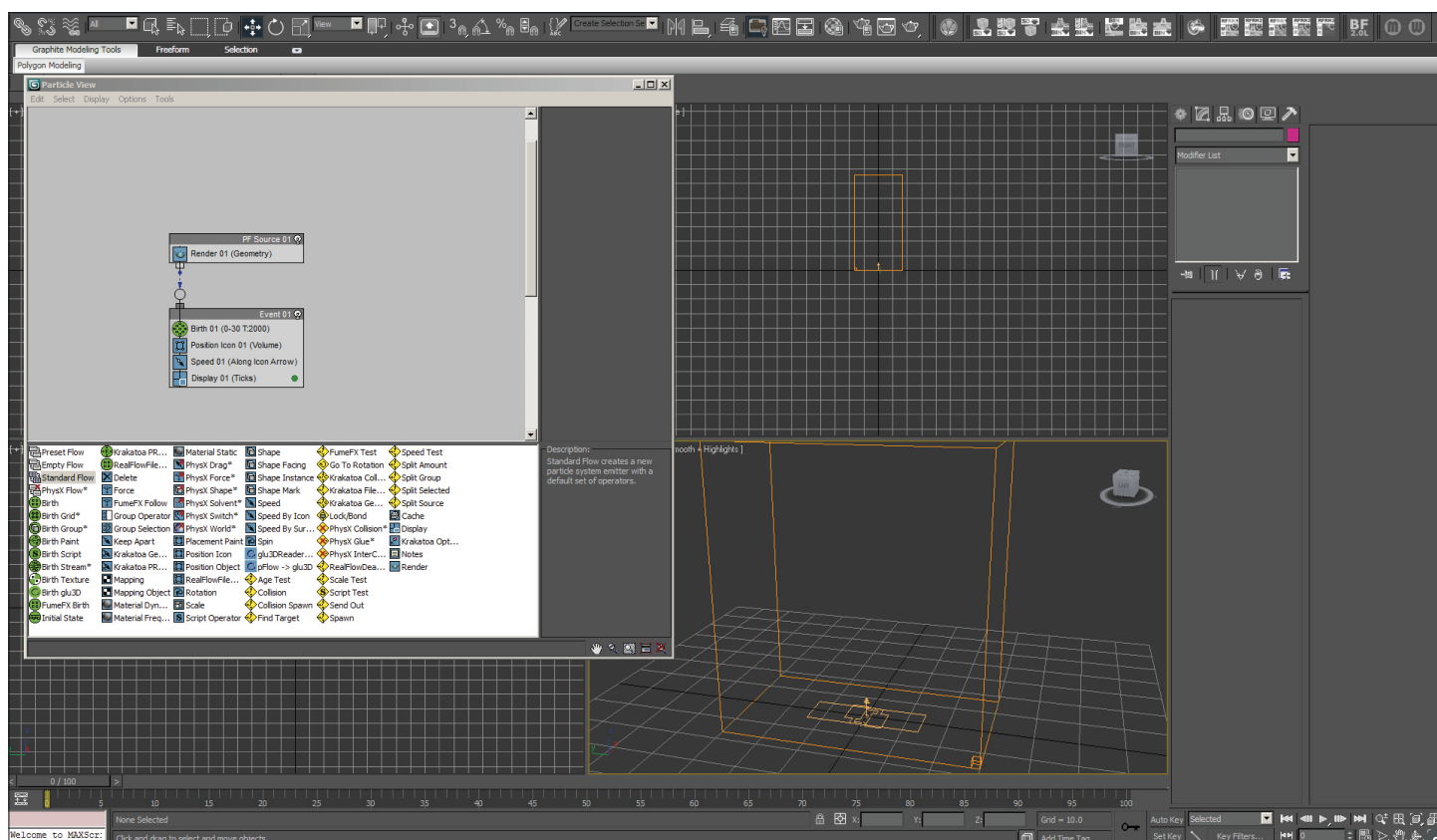
Make the container around 60 units in length, 60 in height and 30 in depth. We can adjust the spacing value later (**Fig.01**).

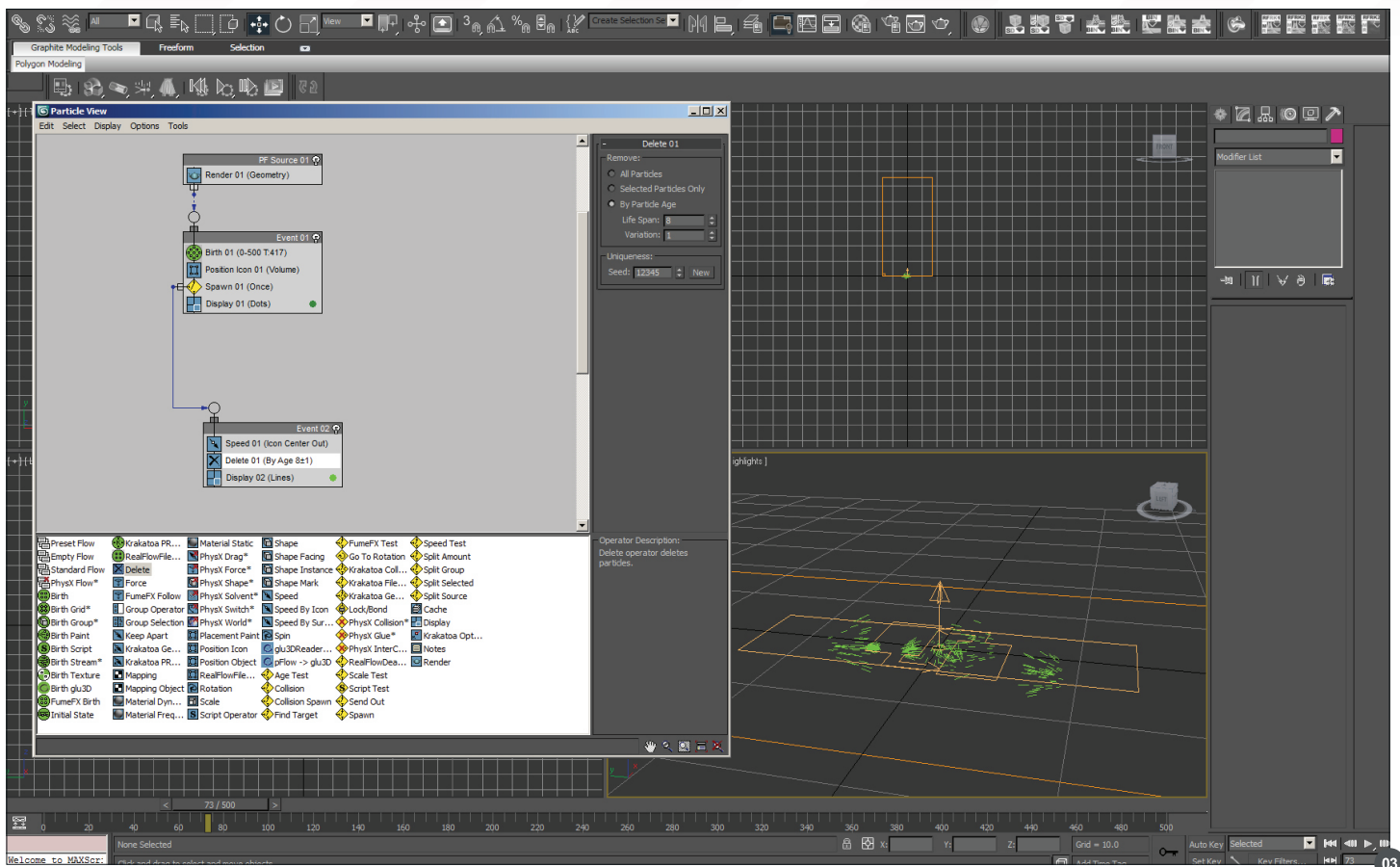
Simple FumeFX sources or object sources can all be used to emit fuel, fire, smoke and so on, but in this tutorial we will make use of Particle Flow by passing the particles to the container.

Hit 6 to open the Particle View. Drag out a Standard Flow and align the Particle Flow

emitter icon with the center of your fume grid. Make the size of the emitter icon around 30 units in length and 10 in width. The particles will be emitted from the surface area on the basic icon. Within Particle View, remove the rotation, speed and shape operators from Event 01 on the particle tree (**Fig.02**).

Change the Birth operator start and stop to make it correspond with your scene length. In this case it's 500 frames. Also change Emission





from Amount to Rate. This means that particles are emitted at a certain rate per second and so our fire setup will be easily adjusted and continuous should our scene later change in length.

If you scrub the timeline, particles will appear upon the icon surface and sit still. Since we removed the Speed operator the particles are simply born and don't travel anywhere. Add a Spawn operator to Event 01 and check the Delete 01 parent box. In the Offspring box, enter a value of 50. This means each emitted particle spawns 50 more and the original single, parent particle is deleted.

Then drag a Speed operator out for the depot to create Event 02 with Particle Flow and set its speed to 0. Also add a Delete operator beneath it and set it to By Particle Age with a life span of 8 and a variation of 1 or 2. You can also change the Display operator to your preference. In this scene, I have set it to Lines to display the direction and velocity of the particles.

If you scrub the timeline what you see will appear the same. This is because all of the spawned, new particles are all exactly on top of one another and currently not visible. Adjust the Divergence spinner in the Spawn operator to spread the spawned particles (**Fig.03**).

Adjust the speed to a low value such as 12, with a variation of 4. Set Direction to Icon Center Out and check the Reverse button.

Now if you scrub the timeline, you will see small bursts of particles being emitted and all firing towards the centre of the icon. We will use these small pulses of particles as a Fuel base for the fire effect within Fume. We can easily adjust the amount and rate of emission that will fuel our fire with this simple setup.

We now need to enable FumeFX to see our simple particle setup. Go to the Helpers menu and under the FumeFX helpers select and create a Particle source. Select the Particle Flow system within the Particle Source helper. Select

the fume container and open the FumeFX GUI.

Under the general parameters be sure to set your desired output path for the simulation.

Fume/fluid simulations can demand a lot of storage space and system resources, so it's a good idea to consider having a dedicated simulations drive.

Under the Simulation tab, change the Spacing value to 0.5. Since this is a fire tutorial (even though FumeFX can also simulate smoke at the same time that is directly influenced and even illuminated by the fire), let's disable Smoke Emission and concentrate on the fire for the time being. Disable the smoke by unchecking the Simulate Smoke box.

Change the Quality spinner to 6 or 7 and reduce the Maximum iterations number to around 80. We want to introduce a little turbulence to our fire to create some breaking up effects, so also enter a low value of 0.4 into the Turbulence spinner.

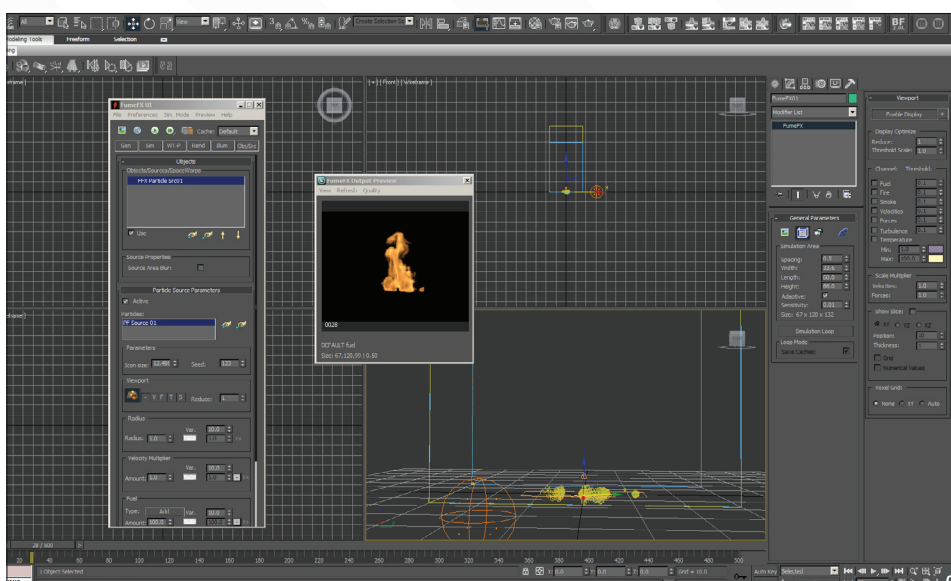
Under Turbulence Noise enter 5 for Scale and 25 for Frames. Scroll down a little more and consider reducing the burn rate to something around 14. These basic first parameters should be a good start.

Before we simulate however, we must add the particle emission to Fume. Go to the Obj/Src tab in the FumeFX GUI and use the Selection tool to select the Particle Source helper we created earlier and linked to the particles.

Later in the tutorial and workflow, we will be adding more detail to the fire by using the Wavelet Turbulence option. For this to work correctly later on, we need to enable Wavelet Turbulence under the Extra Detail tab and also add the velocity channel to the simulated and exported channels. Extra detail is added automatically when you enable it.

Hit the Simulate button and let it run off a number of frames (**Fig.04**).

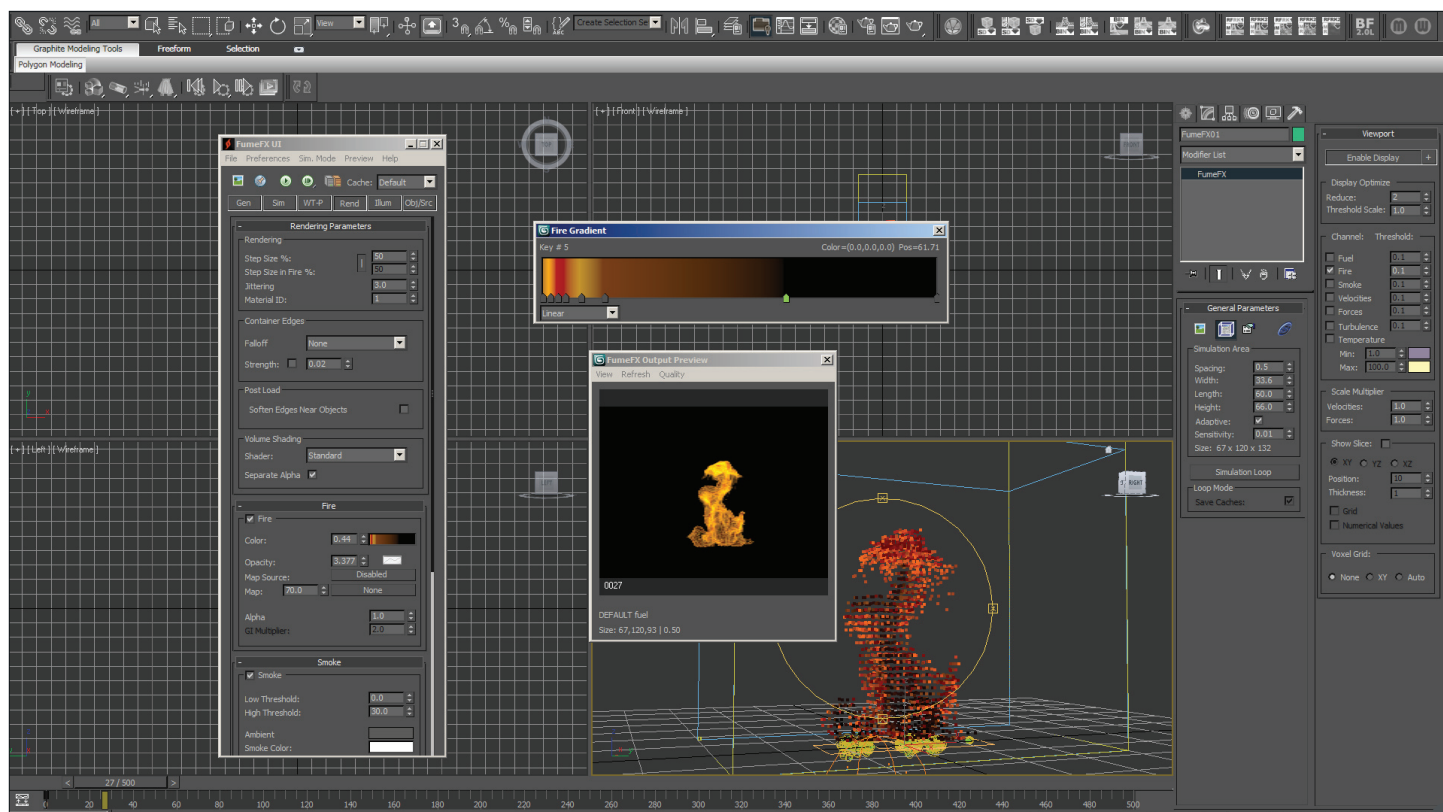
You should see flames emitting from the small particle bursts, and rising and licking upwards

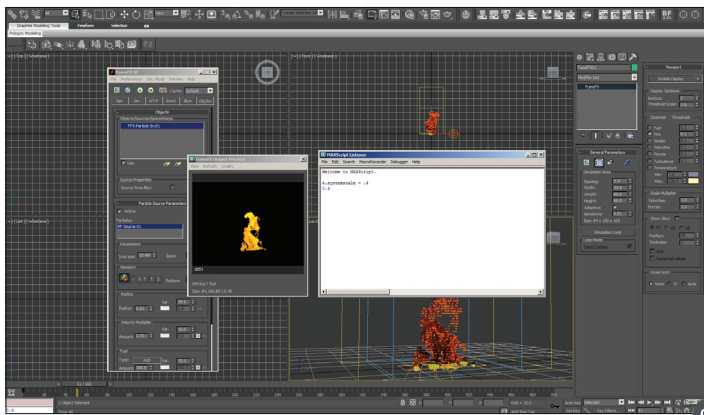


in a realistic way. Let's improve the preview and forthcoming rendering by adjusting the flame colors and going the Rendering tab within the FumeFX GUI.

Under Fire you can adjust the flame color by either using solid colors or introducing a gradient ramp. You can download the gradient ramp I created by clicking on the download link in this tutorial. Load it into FumeFX by right-clicking the color swatch and selecting Load.

Navigate to the Assets folder and load the fire_grad.agt. Feel free to move and adjust the color markers or introduce new ones depending on the look you are after. Increase the opacity to 3.3 and reduce the Color spinner if the flames begin to look too saturated. Right click and disable the Opacity curve box too. You may wish to return to it later to adjust the opacity of the flames, but for now the flames will be controlled by their color and overall opacity (**Fig.05**).





06

Let's revise the simulation properties slightly. Decrease the Timescale value from its default of 1 to 0.75. This will help to make the fire look larger in scale as it burns. Reduce the Vorticity to 0.33 and Turbulence to 0.31.

Under Turbulence Noise decrease the scale number to around 1. This will help add detail within the flames. Further down the options adjust both Burn Rate and Burn Rate Variation.

At this point I should mention that these kinds of effects can be adjusted endlessly and frequently, depending on your taste and creativity. Should you want a fast-burning fire, for instance, you should increase the rate and corresponding values. Lastly, increase Expansion to 1.34. Expansion means the ignition of the particle fuel being emitted will be a little larger, as if eating more oxygen as it burns.

To counteract the blobbiness of the fire that can sometimes happen when expansion is increased, go to the Obj tab and decrease Particle Radius to around 0.6.

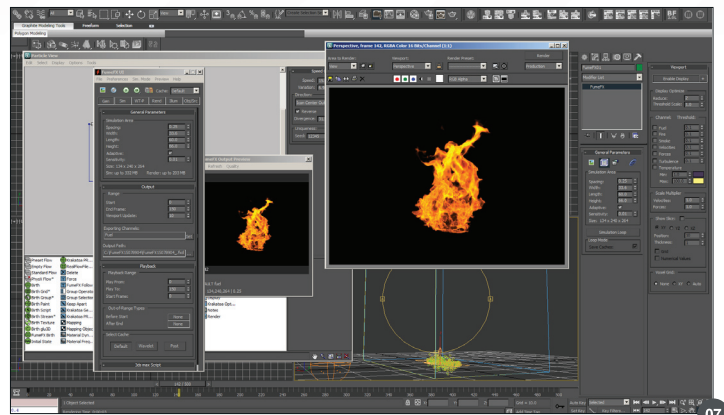
There are many other parameters you can freely experiment with to obtain the fire results you want. In my case I have increased the velocity slightly, raised the temperature and added higher variation in the fuel emission. This will help break up the fire and create more realistic variation as the flames burn at various speeds.

Tip: There is a hidden and unsupported method of forcing FumeFX to deal with scene setups

differently and sometimes more efficiently if you want a larger scale simulation, but don't want to increase your fume grid and then have to re-adjust all of your parameters.

Make sure your fume grid is selected and then go to MAXScript and open the MAXScript Listener. Enter this simple script: `$.systemscale =`. After the equals sign, enter a value of 0.4. By default the system scale is at 1.0 and by changing this we are forcing Fume to handle scale and the parameters we have entered differently internally. You can easily change this back at any time by re-entering this script and the desired value (**Fig.06**).

Now we have adjusted many parameters and even altered the internal scale of the simulation to help get more detail in the fire. Lower Spacing on the FumeFX grid to 0.25 and hit Simulate. Remember to check your Simulation tab for the



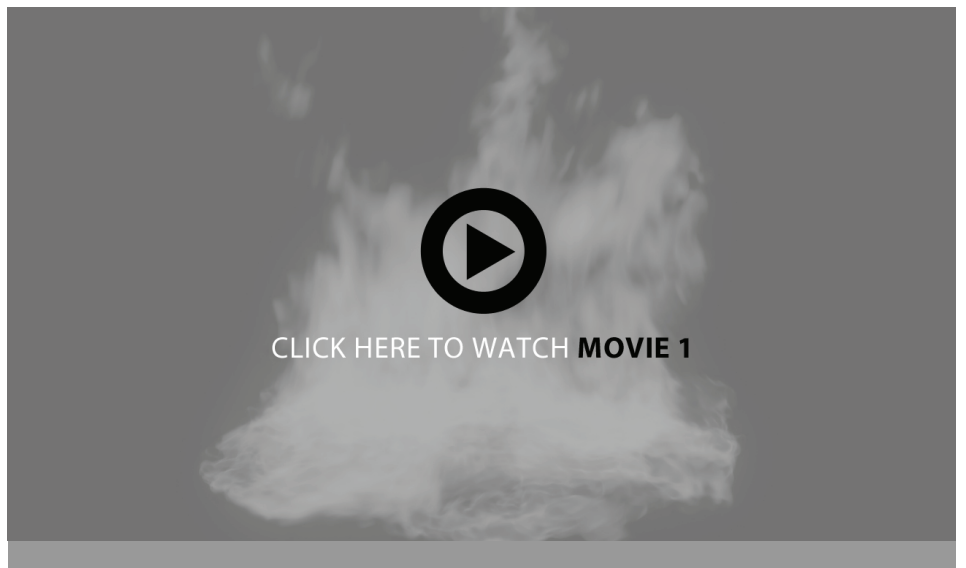
07

simulation range if you wish to simulate past 100 and the full length of your 3ds Max scene (**Fig.07**).

We now have a pretty detailed simulation with long flames rising, licking and breaking apart quite realistically. Refer to the following movie to see my results (**Movie 1**).

This may be a successful result in many cases, but if more detail is required it means lowering the spacing even more, perhaps further adjusting parameters and having an even longer re-simulation time. Lowering the spacing will create more detail, but since FumeFX version 2 there has been a secondary Wavelet Turbulence simulation option.

This means that after your main fire or smoke simulation is complete you can add further scale and detail to the effect by switching on the WT-P



and running a secondary simulation on top of the original cache.

Personally, I do not use this option all that frequently, but it can be a great time-saver upon occasion and works particularly well with flames.

Go to the drop down menu Sim.mode within the FumeFX GUI and select Wavelet. We have now switched the simulation mode to its secondary wavelet turbulence mode and parameters for this can be seen under the WT-P tab. By default it is going to double the scale of the grid internally, whilst keeping our original small grid size and cache intact. Note the icon for the Simulate button has also changed to indicate we are in WT mode.

Since we are not simulating smoke, we can save some disk space by disabling the Smoke tab. Leave the other settings at their defaults and hit the Simulate button.

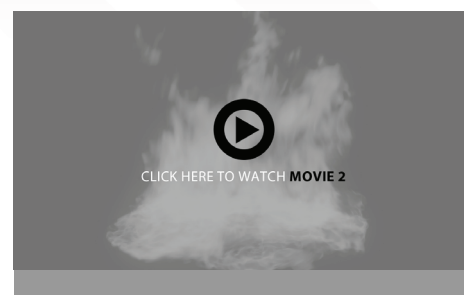
After the simulation has finished we now have two caches saved to disk: our initial fire setup

and a detailed WT version. We can switch between these two and even render both if required by selecting the cache with the drop down menu Cache, in the FumeFX GUI.

Some final adjustments before rendering would be to lower the Step Size % under the Rendering parameters. This will help reduce any banding or artefacts that can sometimes appear.

You can now render out your fire element as an EXR or another desired format. EXR is very useful as it keeps the effect float and therefore is very flexible in the compositing and color grading stage. I have added some glow and color correction to my final render, which you can see in the following video (**Movie 2**).

Tip: To gain extra control in compositing and color correction for your fire, try creating an RGB gradient in the Color swatch for your fire. By carefully adjusting the color sliders, you can position each of these colors from the inner of the flame to the outside edges.



Render this out as a powerful color channel mask for use in compositing. Selecting a single channel (such as green) from this render allows you to isolate a specific region of the flame render.

I hope you have enjoyed this tutorial about fire within Fume and 3ds Max. I encourage you to further develop this simple particle setup to include object emitters and other burning fuel sources (**Movie 3**).

MATT CHANDLER

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Email: matt@angry-pixel.co.uk



CLICK HERE TO WATCH **MOVIE 3**

GUIDE TO FX - **PARTICLES & DYNAMICS**

3DCreative are branching out from creating stills in this amazing tutorial series, which will be looking at how to set up FX and particle systems in 3ds Max and Maya. Our amazingly talented artists will tackle some of the most common and popular effects, and will show us how to set them up and manipulate them to match an environment of your choice.



CHAPTER 03 **FIRE**

CHAPTER 03 – FIRE

Software used: Maya

This chapter will go through the steps to take to create fire. It is quite similar to the last chapter on smoke, with the main differences being we will be using temperature to shade our fluid and the simulation itself will be more turbulent.

Start by creating a 3D fluid container with an emitter (**Fig.01**). For the smoke tutorial we used geometry as an emitter; this time I'll show you how to use a standard emitter. Select your emitter and under Basic Emitter Attributes, set the emitter type to Volume.

Then under Volume Emitter Attributes, set the shape to Cylinder and turn off Normalized Dropoff. This makes it so the dropoff doesn't scale with the emitter and is calculated in world space. Now scale the container to be roughly the same proportions as a coin and place it near the bottom of your container, as seen in **Fig.02**. We will use this to emit fire from a large, flat area and later in the tutorial we will add some turbulence to break up the emission.

For the fluid shape, the default size of 10 x 10 x 10 will be fine. Turn up the base resolution to 50 so we can see a bit more detail as we get the base setting right. Also, set the boundaries to None, -Y Side, None so the fire won't collide with the sides or top of the container. Make sure that under Contents > Method the density,

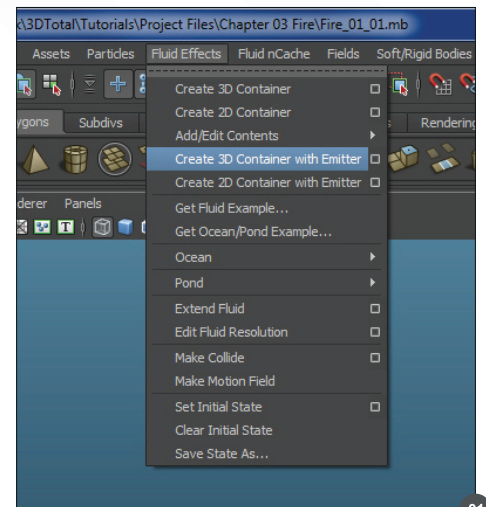
velocity, temp and fuel are all set to Dynamic Grid. Under Dynamic Simulation, set High Detail Solve to All Grids and change Simulation Rate Scale to 2.

For now, under Shading, set the color to black so all the color will come from the incandescence, which is driven by temperature. Also, set the Opacity Input to Temperature. We will come back and edit the rest of the shading settings after we get the simulation looking better.

Now we are going to be changing the simulation settings and play it back to see what it looks like. To make this faster, we should turn on Auto Resize.

Right now if you run the simulation it will just look like red smoke, as seen in **Fig.03**. To get it to behave like fire we need to make some changes. I don't want the density influencing the fire, so under the content details for Density I set Density Scale to 0. Later I can set the Buoyancy to a negative value and turn up the scale if I want it to fight against the temperature buoyancy to create some additional turbulence.

Also, we should note that even though the density will not influence the simulation with a scale of 0, the density is still calculated and taken into account when determining which voxels to include in the auto-resize. So if Dissipation is left at 0, the auto-resize container



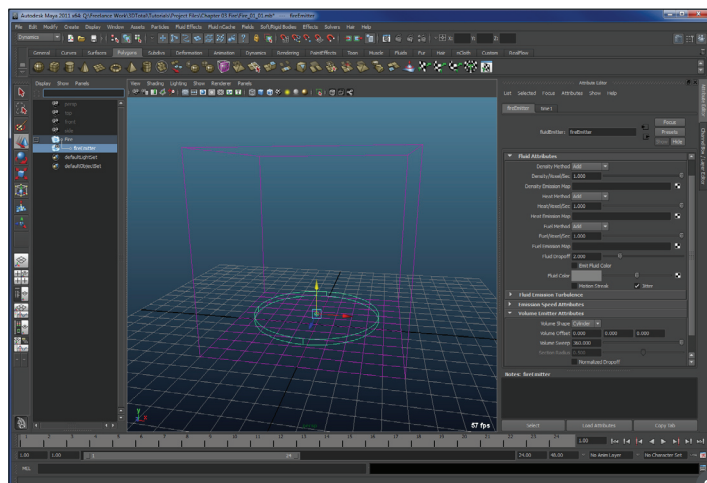
01

will get much larger than your fire. So make sure to set it to a value similar to your temperature dissipation.

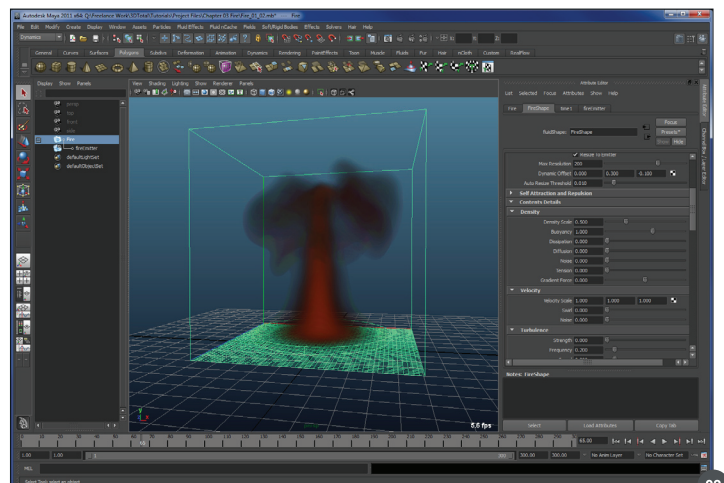
Fire has a lot of turbulence in it, so set the Velocity Swirl value to 4, but leave the Turbulence Strength at 0. We are going to use the turbulence for the larger scale wind later, and use the swirl and temperature turbulence for the smaller scale turbulence within the fire.

For Temperature, set Buoyancy to 3, Dissipation to 1, Diffusion to 0 and Turbulence to 2. This will make the fire rise quickly and die off quickly while maintaining sharp edges. For Fuel set Reaction Speed to 1, Ignition Temperature to 0, and Max Temperature to 0 so that all the fuel will get burned up as soon as it is emitted.

Now let's run the simulation and see what we have (**Movie 1**).



02



03

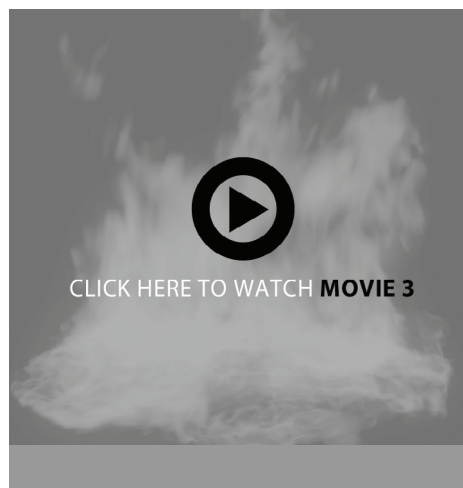
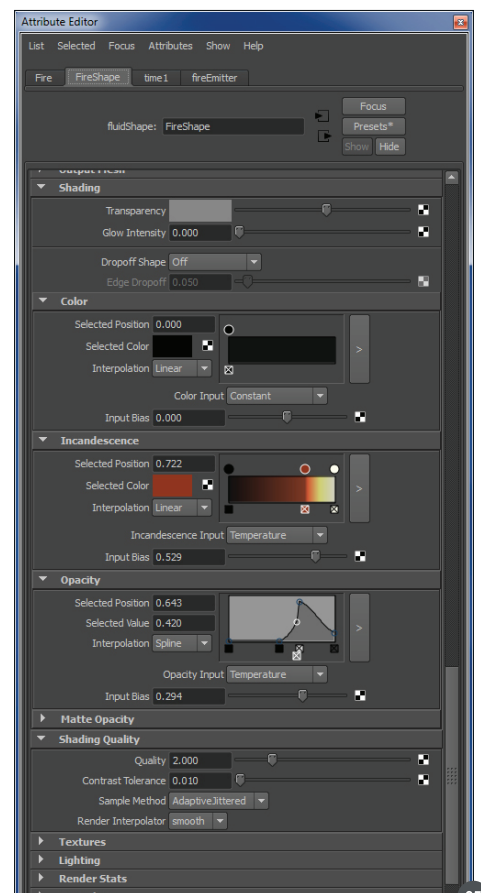
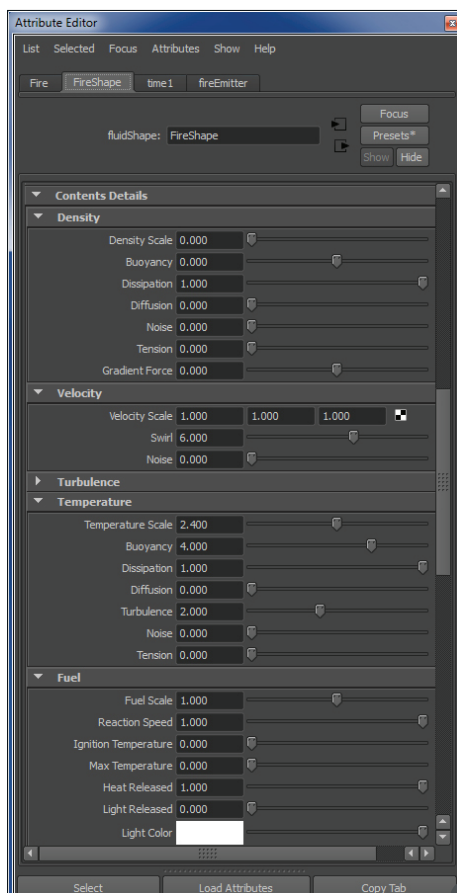
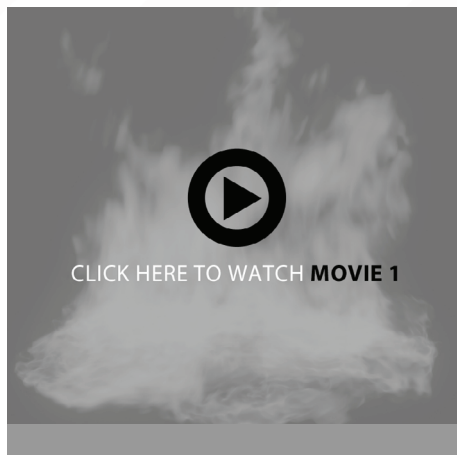
It looks a lot more like fire than before, but it is still pretty smoky. It could rise a bit faster as well as have more temperature. After running through some different values, **Fig.04** shows the numbers I've ended up with (**Movie 2**).

It still looks a bit smoky, but it behaves much more like fire. Now we can go to Shading to get it to look more like fire. Set Transparency to around 50%. We can fine-tune it using the opacity ramp.

For the incandescence, a good trick is to use overly bright values to get the ramp you want. When picking the color switch to HSV and set V to values higher than 1. For my brightest color I use H:13, S:0.815, V:5. Once you set your ramp, you can use the Input Bias to shift where the ramp matches with the temperature. You will be able to see where the colors are in the viewport as you shift it back and forth.

It is difficult to explain why I do what I do with the values for the opacity ramp. Experience has shown me that having a high peak that tapers off on either side works well for fire. With the cooler temperature being on the left and the higher on the right, the ramp will make it so that the fire will disappear completely as it cools off, as well as the core being transparent so it doesn't get blown out in the render.

When you start changing the opacity ramp values, the viewport display will no longer be

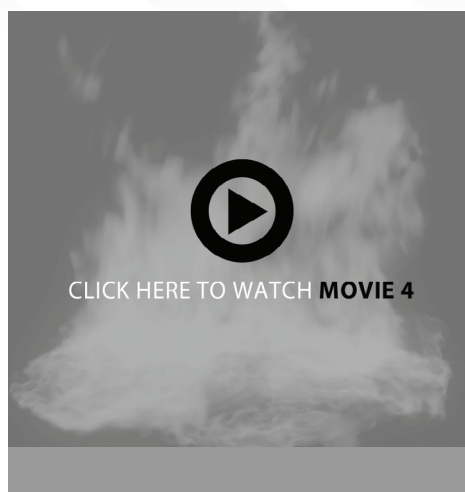


as accurate. So you should start rendering out frames to see what it looks like. Make sure to turn up Shading Quality to 2 and set the Render Interpolation to smooth. The values I end up using for Shading are seen in **Fig.05**.

Well I think it is about time to turn up the resolution and see what it looks like. I end up using a base resolution of 133 (**Movie 3**).

Now that we have a good-looking, perfectly cone-shaped fire, let's see if we can break it

up a bit more. Turn up the Content Details > Turbulence Strength to 0.04. This is a larger scale wind that we don't want to be too strong, just enough to push it around a bit. Another thing that will help is to not emit from a perfect circle. Under the Fluid Emission Attributes for the emitter, turn up the turbulence to 10 and the turbulence speed to 0.1. This will add some noise to the emission. I also turn off the auto-resize so the turbulence will be calculated in the areas around the fire, not just the fire itself (**Movie 4**).



Now that is a nice looking fire. It's time to render it out. Like I mentioned in the last chapter, you can set the render settings to low and it won't affect the render quality unless you have a matte object moving through the fire. This should help speed up your render times.

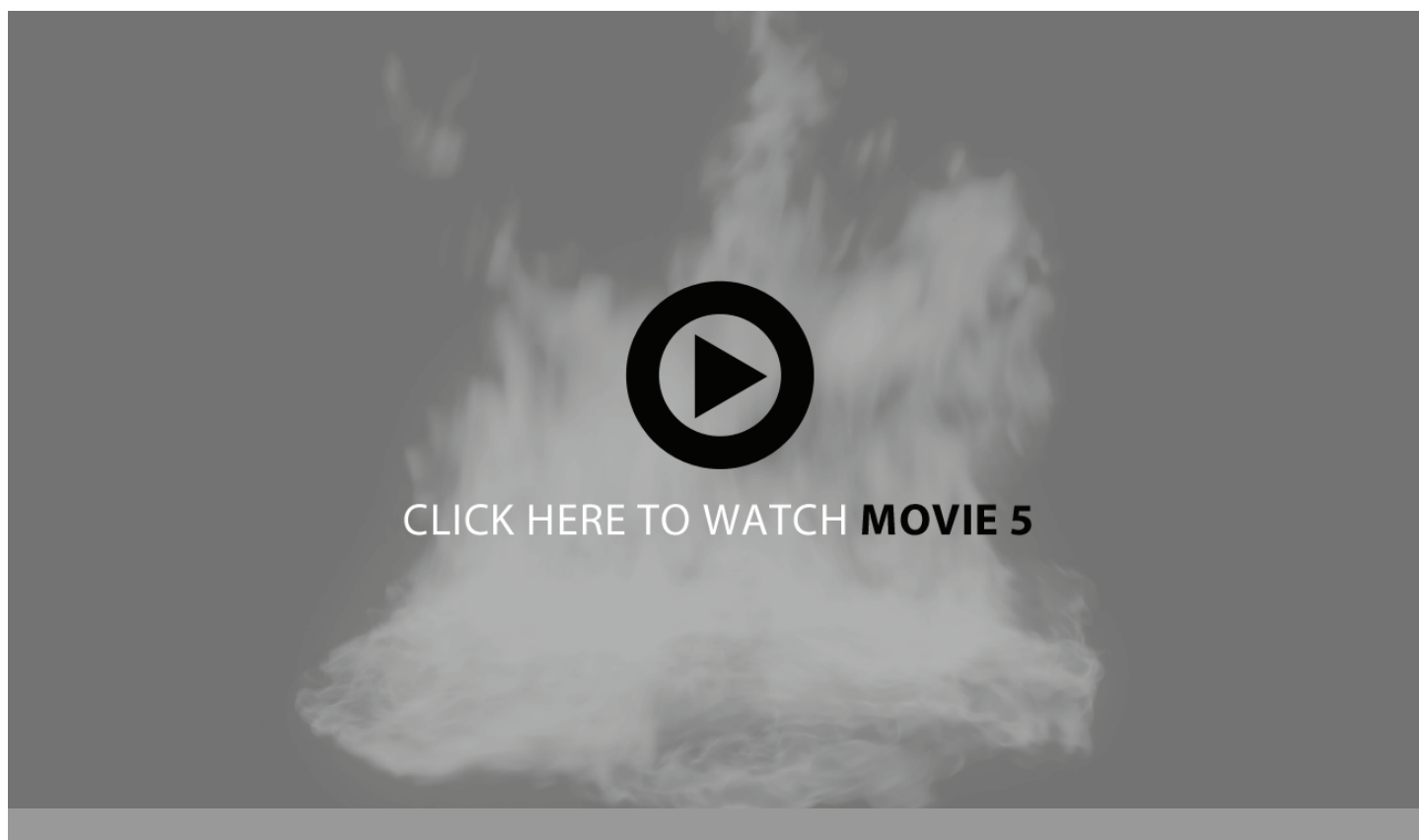
Motion blur and glows can add a lot to the realism of your fire. You can see the difference between a raw render and one with motion blur

and glows added in **Fig.06**. I used a plugin in my compositing program to add the motion blur to the fire. I also felt like the fire was still moving a bit slowly for my taste, so I did some time remapping in post to double the playback speed (**Movie 5**).

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Characters are, of course, a popular subject for CG artists. However in this series we will be approaching creating characters in a slightly different way. Each of our amazingly talented artists will be provided with a 2D concept and technical drawing of a cool, sci-fi droid. They will then show us how to turn this 2D information into an accurate and exciting 3D model. Many techniques and approaches will be used throughout the series, which will provide all of us with a great opportunity to develop our own 3D skills.

FIGHTER DROID

CHAPTER 03 – FIGHTER DROID

Software used: 3ds Max

INTRODUCTION

I was invited to write a tutorial about modeling a fighter droid. The concept and a modeling sheet were provided along with the invitation, and I decided to make a next-gen gaming model. This tutorial will focus on the basic pipeline of next-gen gaming model making, including modeling low/high res models in 3ds Max, creating a normal map with xNormal and hand-painting textures in Photoshop (**Fig.01 – 02**).

GENERAL MODELING ADVICE FOR BEGINNERS

In the brief I was told that the tutorial should be somewhat aimed at beginners and that I didn't have to completely follow the concept, although I decided to follow it as much as I could. For beginners who want to step into the industry, I've got two pieces of advice for you:

1. Always start with a concept made by an industry professional.

I've taught at school for several years and know that many young folks model without any concepts, or model from their own imagination. The results are usually not impressive to either the viewer or the modeler him/herself. Design is basically

the reassembling of one's experiences and memories. Beginners, relatively speaking, don't have the skills or experience to model effectively without concepts, and therefore having a concept made by a professional to refer to is critical for them. In my case, I didn't personally design anything until I'd been working in the industry for five years.

2. Always stick to the concept as much as possible.

Modeling 3D objects out of 2D concepts is a daily task for a modeler, whereas creating and modifying designs is usually not (that's what concept artists and art directors are for). Beginners should put their focus on where it's needed.

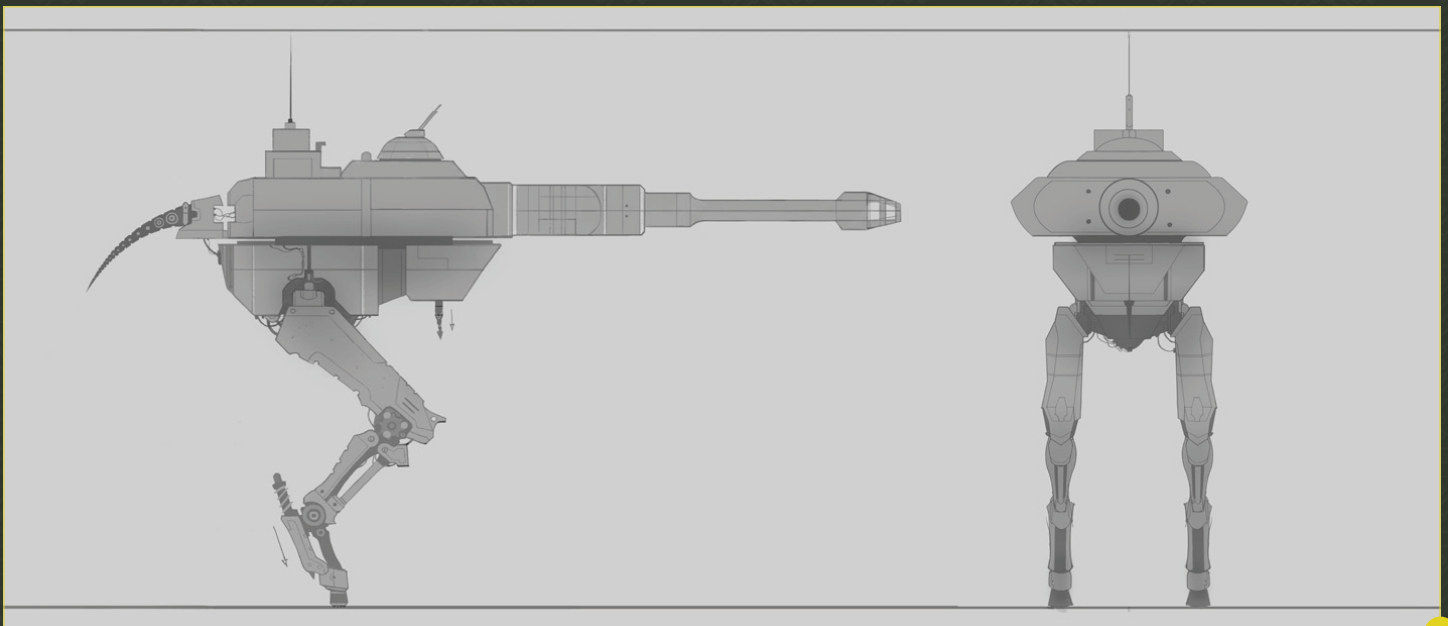
As for a demo reel, I always show the concept along with my 3D result, to showcase my skills at studying and following the source material. I usually end up in a good place by doing this.

PRE-PRODUCTION

Jumping right into the modeling is usually not a good idea. A pre-production warm-up is always necessary. Before I start anything in 3ds Max, I usually spend around an hour at the beginning of each project estimating the workload and level of complexity of the subject, the time cost, identifying potential technical challenges and finding solutions before I actually run into them. I always make a production plan like the following:



01



02

- Rough geo: 2 days (1hr/day)
- High res: 12 days
- In-game low res: 2 days
- UV: 2 days
- Baking: 1 day
- Bake map clean-up: 1 day
- Texturing: 8 days
- Final retouch: 2 days
- Screenshot for tutorial: 1 day
- Write tutorial: 3 days

I don't start the project unless I have a reasonable production schedule.

ROUGH GEO IN 3DS MAX

After studying the concept and modeling sheet carefully, I start the block-out phase in 3ds Max. The idea of this step is to build up the general shape of the object as quickly as possible, to further understand the object. Technically it's nothing complicated. I put a bunch of primitive shapes together, add some lines and move the vertices to roughly where they need to be. Each component doesn't have to be precise; it's fine as long as they indicate relatively correct shapes and sizes. There are areas where the concept

and the modeling sheet don't match. I blend the two together during the block-out phase, making the model easy to make, yet not losing its original feel (**Fig.03**).

HIGH/LOW RES GEO IN 3DS MAX

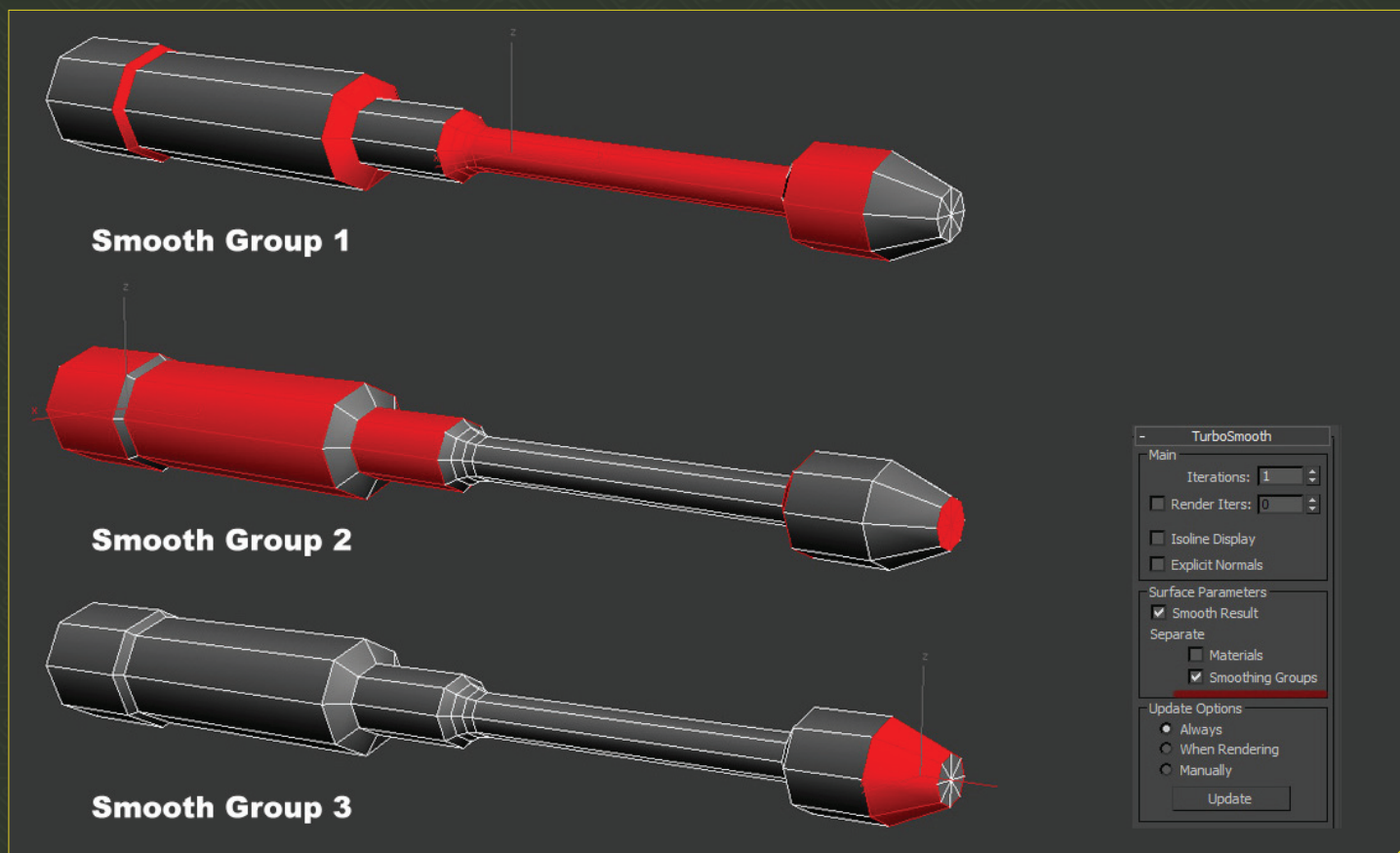
Once the rough geo is done, I start the high res phase. I leave the rough geo in the scene and freeze it, so I can have a visual guideline. I use a common technique in 3ds Max to make

the high res version: Smooth Group + double TurboSmooth. I then separate the smoothing groups.

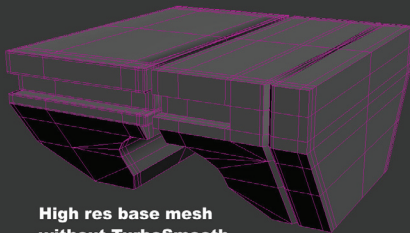
Once that is done, I put a TurboSmooth modifier on the object, with the Smoothing Group option checked and put the level of TurboSmooth at 2 or 3. That will give me enough density on the mesh. Then I put another TurboSmooth modifier on. This will put a smooth edge on the borders (**Fig.04**).



03



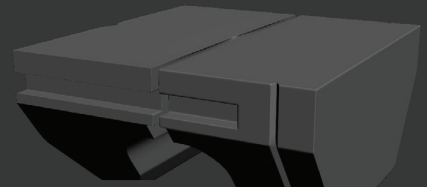
04



High res base mesh
without TurboSmooth

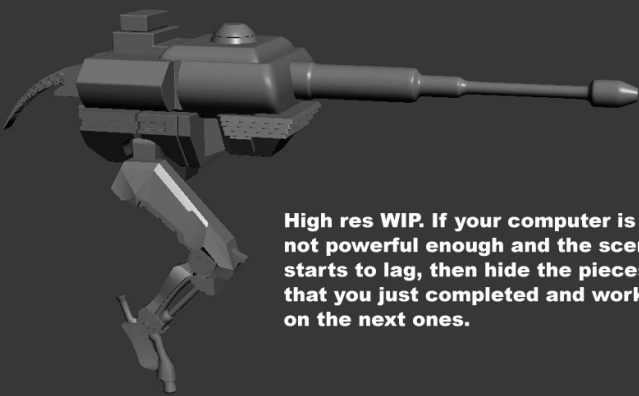


First TurboSmooth, with three
iterations and separate smoothing

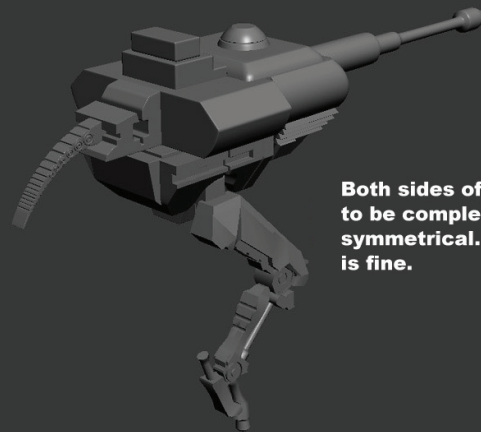


Second TurboSmooth, with two iterations.
Don't separate the smoothing groups.

05



High res WIP. If your computer is
not powerful enough and the scene
starts to lag, then hide the pieces
that you just completed and work
on the next ones.



Both sides of the body need
to be completed, even if it is
symmetrical. For the leg, one
is fine.

06

Sometimes when the shape is complex, more edges are required initially before putting on any TurboSmooth (Fig.05).

Once all the high res shapes are completed (Fig.06), I save the file as Fighter_droid_high_rez_final.max, and export each individual shape as high***.obj. into a high res folder. Then I delete all the modifiers on each component, merge them into one piece, triangulate and optimized each of them, save the files as Fighter_droid_low_rez_final, and finally export the object out as low***.obj.

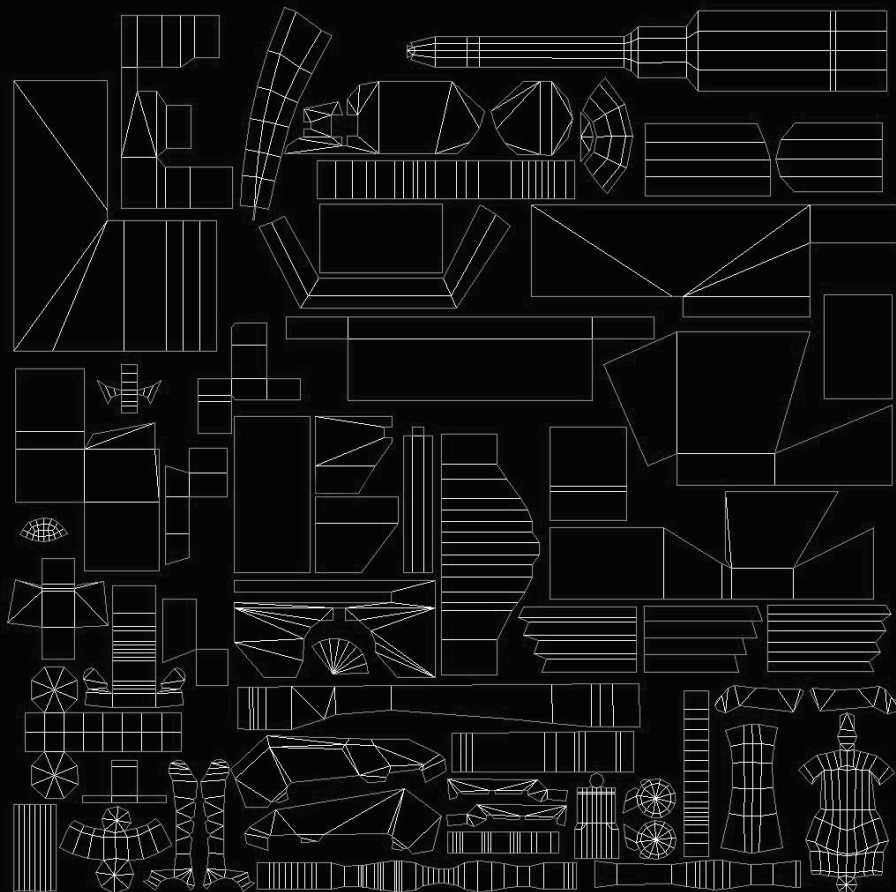
UV

For mechanical objects such as this droid, I use unfold mapping for most of the cubical objects, and pelt for most of the non-primitive objects, with desired seam lines selected. When placing the UVs I put them in order from top to bottom, so when I texture later on I know which piece is which (Fig.07).

BAKING NORMAL AND AO MAPS IN XNORMAL

I usually bake my Normal and AO maps in xNormal. If you have never used it before, don't

07



worry; it's free to download and it's very easy to use. All you have to do is import each high res piece into the high res panel and each low res object into the low res panel, then select which high res object source to bake from and which low res to bake on. Then set up the path, have Normal and AO checked and then you're good to go. The following image is a step-by-step of how to use xNormal (Fig.08).

I get two maps for each high res component I bake: one Normal and one AO. Once I have all the maps that I need, I move into Photoshop.

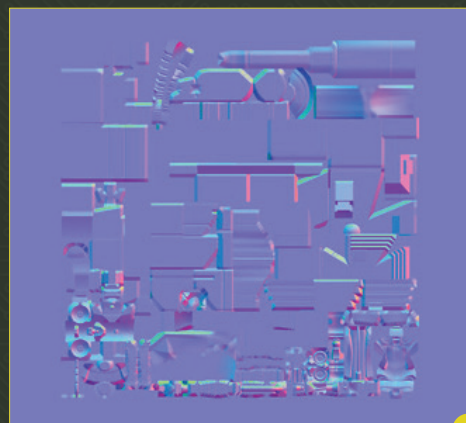
COMPLETING THE NORMAL AND AO MAPS

When baking in xNormal, sometimes the information will bleed into areas where I don't desire it to. I bring all the maps into Photoshop as layers, name them and then use masks to clean up each layer. I work on the AO layers first, then copy and paste the mask to each corresponding Normal layer.

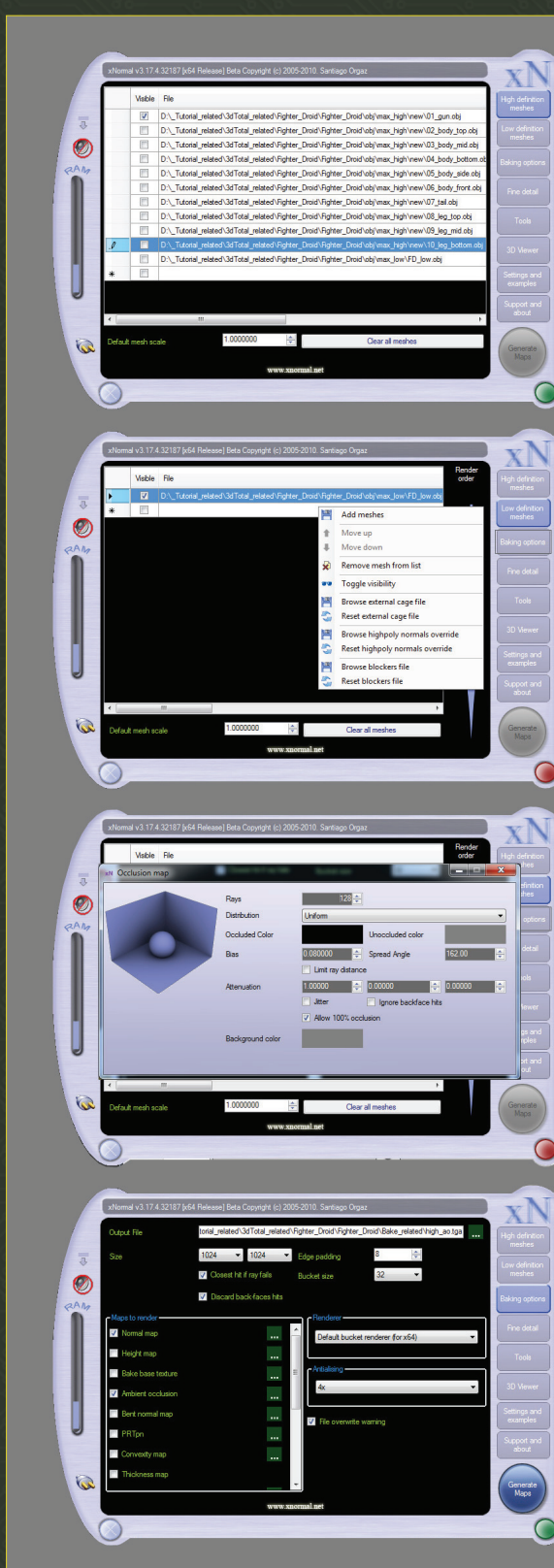
At the end I get a complete Normal map and AO map (Fig.09 – 10).



09



10



Step One: Load all of the source objects that you want to bake from into the High definition meshes section. Have Visible checked if you want to load everything, yet use one individual object at a time.

You can right-click on the empty space to access a drop down panel and find the Add Meshes command to import.

Step Two: Load the object that you want to bake to into the Low definition meshes section.

Step Three: In the Baking options section, check Normal map and Ambient Occlusion under Maps to render.

You can modify the property of the maps that you want to bake by clicking on the "..." button.

This image shows my settings for the Ambient Occlusion map. Instead of using the standard black/white color, I use a black/mid-gray. The RGB value for mid-gray is 128/128/128.

Step Four: Click on the "..." button behind the Output File field to set the output path and file name.

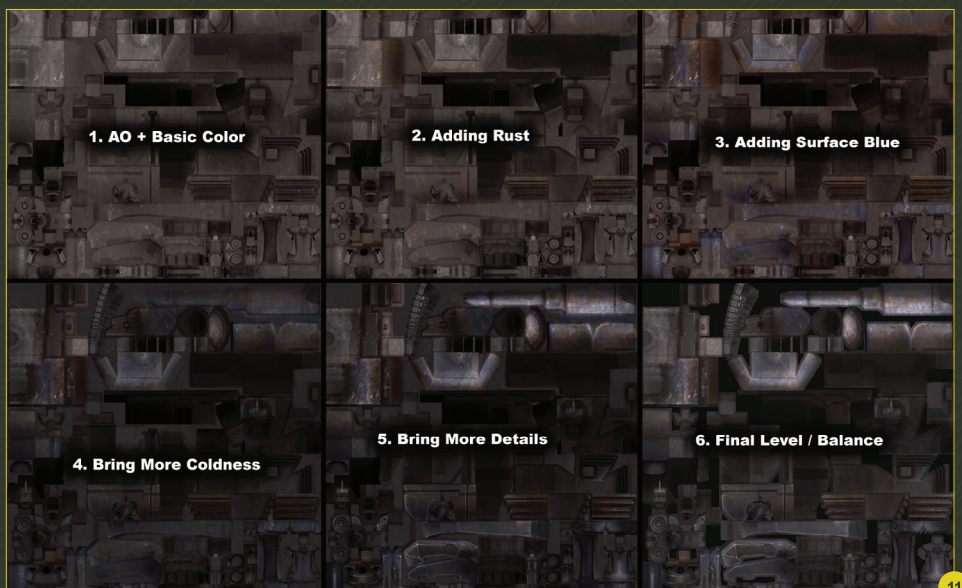
Once everything is complete, hit the big blue button in the bottom right-hand corner that says Generate Maps.

TEXTURING

It's hard to explain the actual techniques when hand-painting a diffuse texture. However I can still talk about the steps that I take. When creating a hand-painted texture, I usually work with five layer groups.

I put base color, AO, and any additional color information such as signs and labels, in the first group. The second group, above the first one, contains all adjustments such as Level, Saturation, and Color Balance. The third group is an overlay shading group, which goes on

top of 1 and 2. The fourth group, above all layer groups, is a linear dodge group, which pronounces all the highlights on the edges. Finally, the fifth layer group contains the UV of the object. It helps me to know where I'm painting. The following image shows how I progress and the result I get (Fig.11).



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CONCLUSION

I hope you enjoyed this rough tutorial. I didn't complete the model, nor the texture, because I'm giving out the model and texture for free (and I don't want people just take the complete model and full-size texture and use it in their reel for a job hunt). Feel free to use it as studying

material, or rig and animate it if you are an animator. Thank you and see you next time.

JACK ZHANG

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Email: jackzhang.digital@gmail.com





03

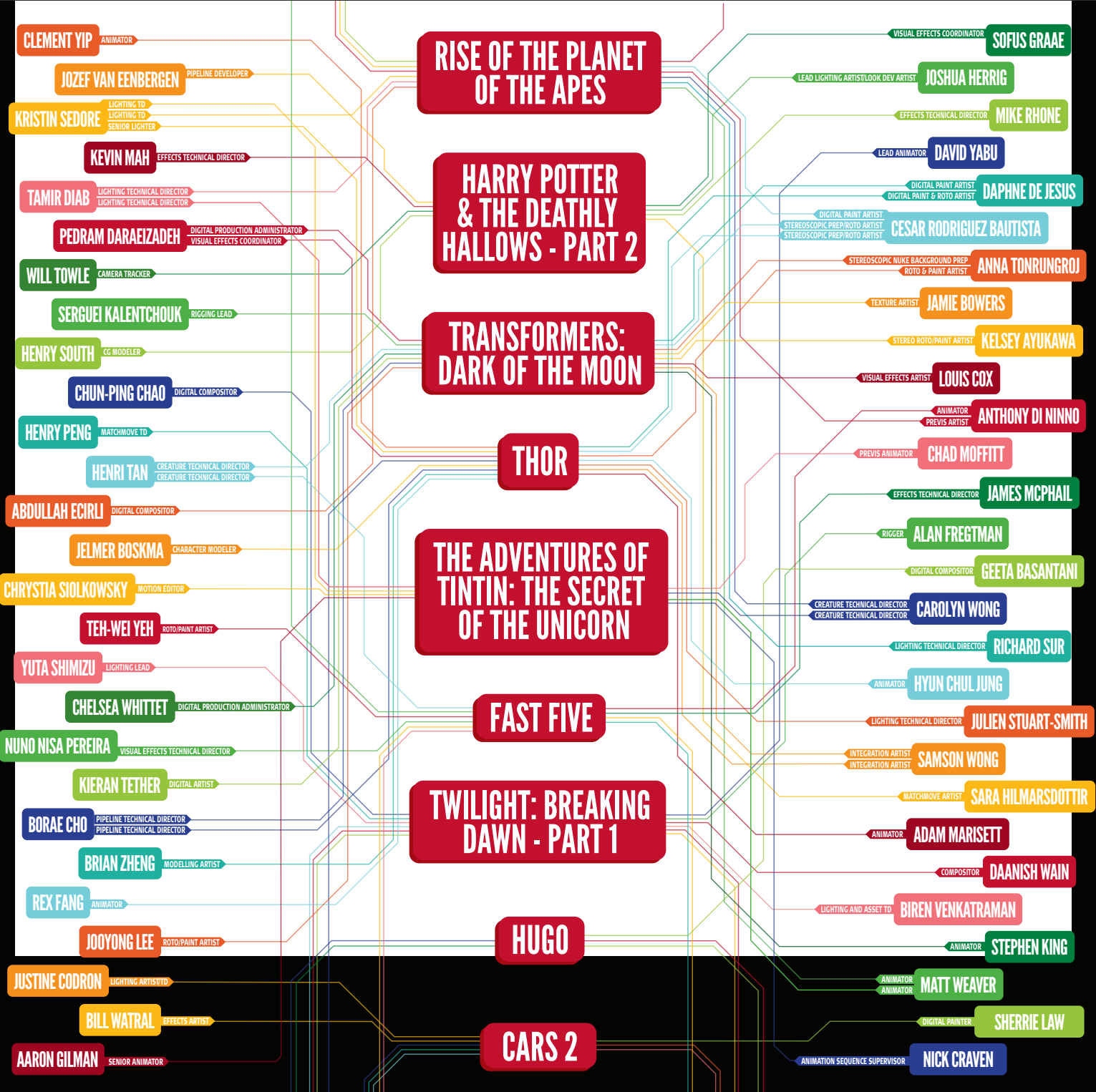


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ARMORED BEASTS

ZBrush is a formidable piece of software that is capable of so much. The possibilities are endless and the only restriction is your imagination. In this series our artists will be flexing their creative muscles to show us how to create not only the organic forms of their beasts, but also the non-organic forms that make up their armor and weaponry. Follow the creation process from initial concept through to final illustration and find out how to create some mind-blowing armored beasts!

JANUARY ISSUE 077 Chapter 01 | Lizard FEBRUARY ISSUE 078 Chapter 02 | Bear MARCH ISSUE 079 Chapter 03 | Chicken
APRIL ISSUE 080 Chapter 04 | Gorilla MAY ISSUE 081 Chapter 05 | Rhino THIS ISSUE Chapter 06 | Cat

CHAPTER 06 – CAT

Software used: ZBrush

My name is Christopher Brändström and I'm a freelance character/creature artist in the movie, commercial and gaming industry. What I want to show in this tutorial is a very basic, but effective, workflow covering how to do a basic concept process in ZBrush and composition in Photoshop. I'm going to give some pointers on what to think about and what to avoid, and look at using some additional software, to make a nice-looking final concept image.

Usually when I start working on a concept I need to have a general idea about what I want to create. The wonderful thing with concepts is that during your creation process, you are most likely going to stumble upon something that might change your image radically; something that you initially didn't think of. This happens to me almost every time and I just simply go with it

and see where it takes me. Sometimes it might look like the most awesome thing ever, and sometimes it might look like terrible.

Usually when sculpting, I start off with a model from my library. If you're creating concepts you're not trying to show your skills as a lighting artist, modeler or texture artist. You're trying to show off an image as a whole picture. So why waste time creating something from scratch?

When creating this armored cat-animal, I thought I'd show how easy it is to create something from scratch using ZBrush R3b, rather than using models from my library.

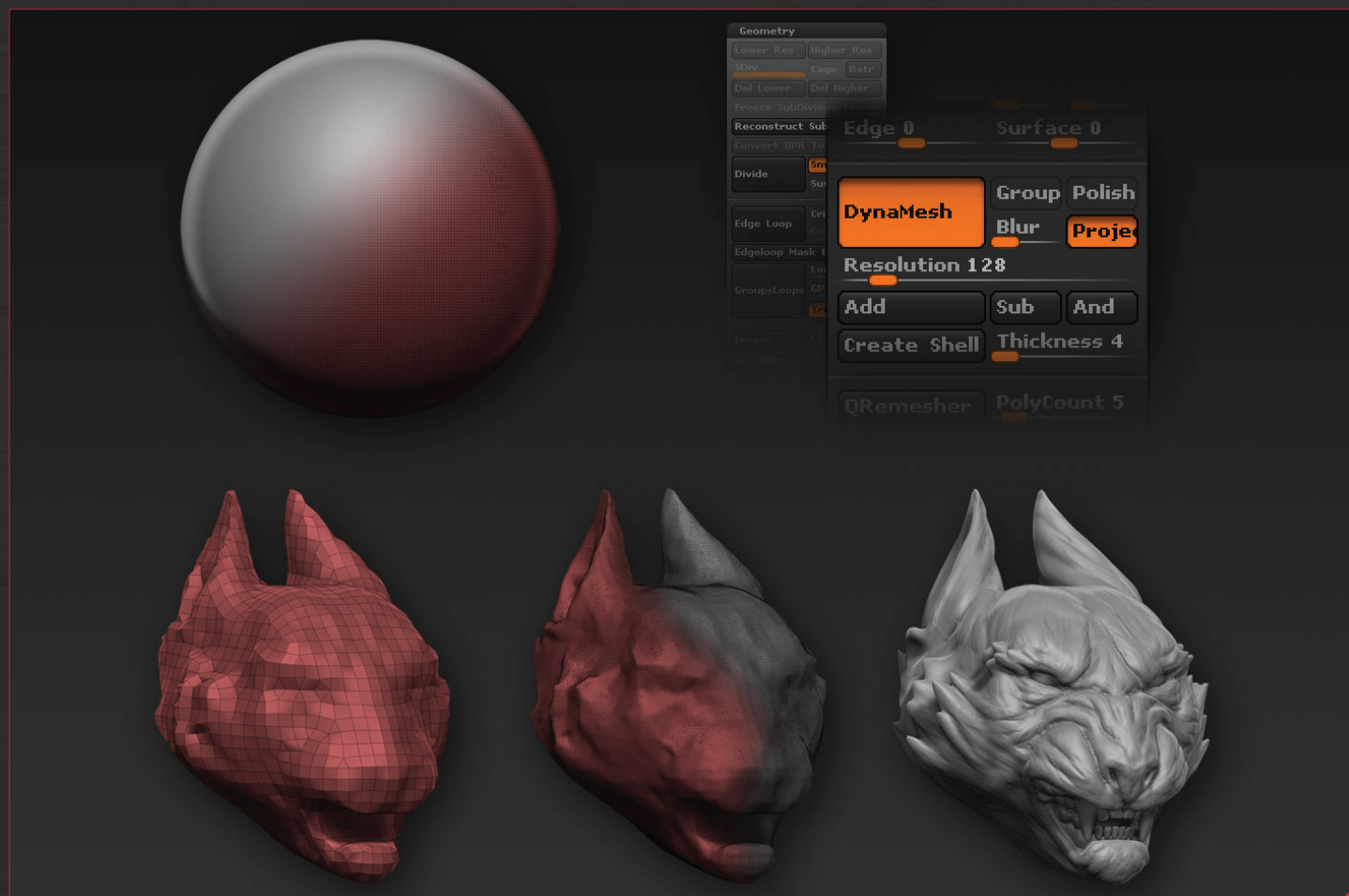
Before the DynaMesh function in ZBrush, you had more or less four options to get started with a fairly even topology:

- Create a mesh with an even topology in software like Maya and import to ZBrush

- Import a rough mesh from the other software into ZBrush, do a ReMesh All and project the old geometry for a more accurate shape
- Import a rough mesh from the other software into ZBrush and use ZBrush Topology to create a new topology, vertex by vertex.
- Create something from scratch using ZSpheres.

Now with DynaMesh, you can just start working off of a sphere. Stretch and pull it however you like, run DynaMesh and continue working with a nice, clean and even topology. Also, make sure to check the Projection button, so you can keep the detailed work when DynaMeshing.

Important: Make sure your mesh has the proper scale. If the scale is too big, you might end up with millions of polygons on the lowest DynaMesh resolution, which makes it hard for



you to work. Always check this before you start working (**Fig.01**).

At this point I've gone through a couple of head designs using DynaMesh; starting off with one head, duplicating it, creating another and so on. Usually I use layers when creating different shapes from a single mesh, to keep the scenes small and easy to use. Since DynaMesh creates a new topology every time you use it, the layer function won't work and you'll have to duplicate the mesh instead.

After looking through the designs I choose to go with the first, more alien-looking head. My idea at this point is to make the armor natural, made out of the skeleton of the creature. I use the Clay Buildup, Insert Cylinder, Polish and ClipCurve brushes to achieve this result (**Fig.02**).

I'm still using DynaMesh quite heavily when creating the body. I have the head as a separate subtool and the body was initially just a sphere like the head was.

Before DynaMesh, I didn't use the SnakeHook brush as heavily as I do now. It has a tendency to create really cool, flowing shapes, but it always messed up the topology because of that. Now that's no longer a problem with DynaMesh.

As I did with the holes in the head, I use the Insert Cylinder brush with a negative option, which means instead of adding a cylinder when using DynaMesh it creates a Boolean, a hole, instead. I do this by holding down Alt when



02



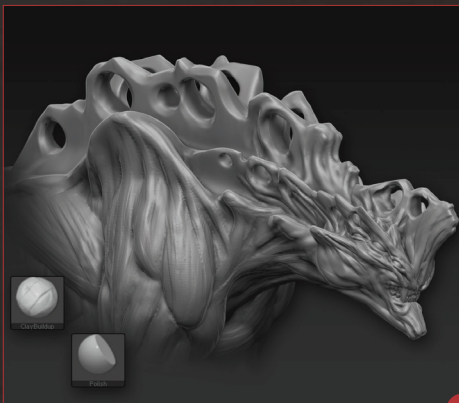
03

inserting the cylinder and then using DynaMesh (**Fig.03**).

I've now started adding more detail to the body. I'm still leaving the head as it is, since I don't really want to add any more detail at this point. I may have already added too much, considering I'm still not sure which direction it is heading.

I continue to work on the body, using the Polish brush more heavily now, to create harder edges and combining the organic feel with the Clay Buildup brush.

When adding the muscles I start to see the model as a whole and it gives me doubts about whether I'm actually going in the right direction.



04

It's definitely alien, but is it really an alien cat or an alien something else (**Fig.04**)?

So I decide to remove most of the features on the body, because it's started to feel more like an alien dinosaur than an alien cat. I know that I will be adding fur later on, but that doesn't mean it will look any more cat-like. So I go back a couple of steps and start to look at the overall features again, but I still keep the head. I use

the Transpose tool to work more on the rotation of the body. Now it feels more like a cat/panther, but the head is a bit out of place, as I've removed all of the hard-skeleton features on the body, using the ClipCurve brush. So I take off the head and replace it with one of the previous ones I've made.

To get the armor on the back, I simply take the head, duplicate it, use the ClipCurve brush quite



05

extensively on it and finalize it with DynaMesh and the ClayPolish feature, to enhance the harder edges a bit. This keeps the feel of the head armor flowing to the armor on the body, with a few alterations, of course (**Fig.05**).

After duplicating the body armor pieces a couple of times and moving it around on the body, I'm starting to feel more satisfied with the shape. At this point I'm starting to think more about what the final image will look like, so I tilt the head up a little to make the creature look a bit more aggressive and present. I also start having fun with the tail using the SnakeHook brush, trying to get a long, swirly and interesting shape (**Fig.06**).

Since this is a cat-like animal, it needs fur. Of course, there are cats that don't have fur and maybe I can make a concept like that too, but for this tutorial I want to make it a bit more obvious that it is a cat-like animal over anything else. Also, this will give me the opportunity to have some fun and try out ZBrush's FiberMesh feature that came with the R2b update.

I will not go into any real detail to what settings I'm using in FiberMesh, but like most things in ZBrush, FiberMesh uses the scale and polygon density of the model, so your settings might change from model to model. Basically what I do is focus, once again, on the overall shape of the fur and not every single little detail, since that can easily be changed with a few simple brush strokes on the final image. This gives me the option to use the ZBrush fur (which can be



06



07

exported as proper geometry) in the final image or simply use it as a reference (**Fig.07**).

Alright, so now with the model done, I want to start looking more into the composition and look of the final image. For that I usually use modo because of the extremely simple realtime rendering and pre-made materials. I know a lot of people who use ZBrush, V-Ray, Maya or KeyShot for this. As I wrote at the beginning of this tutorial, what I'm trying to do is to create a concept, not to show off how good I am at tweaking material sliders or sculpting wrinkles that will never be visible anyway (unless, that is specifically what I'm aiming to show).

I import the model into modo and start moving it around, along with a camera and other models, to find an interesting composition (**Fig.08**).

When I finally have the composition that I'm most pleased with, I start adding materials to the different models and also start creating a render layer. They will help me separate the materials, and add depth, mask, etc., when compositing it later on in Photoshop (**Fig.09**).

So this is what the final image looks like, after having worked on it in Photoshop (**Fig.10**).

What you need to keep in mind when doing a concept for a client or for your own personal portfolio, is time and what is it that you really want to show. You could spend weeks on completing a concept (this might be fine on rare occasions); I prefer to spend a maximum of 1-2 days on a concept, like this one. So the reason I didn't start painting textures in ZBrush, was because I was creating a concept image, not a turntable or animation, just an image.

By doing this I can spend more time working on an overall rough shape and do the really intricate detailing in 2D instead of 3D, but still be able to use the lighting, shadows and some colors from the 3D models. This makes it easier for me to change something, in cases where the



08



09

client wants something a different color, the skin to have a different type of texture etc.

If I take this image I just made for example, the client might feel that it's too detailed and too final for him/her to give any feedback on. Therefore it's very important to spend the right amount of time on the right type of image. I'd rather create 4-5 images in a week that give the

client a lot of options, like the different types of heads I did, than spend a week or two on an image that might be dismissed in 10 seconds and then not have anything more to show.

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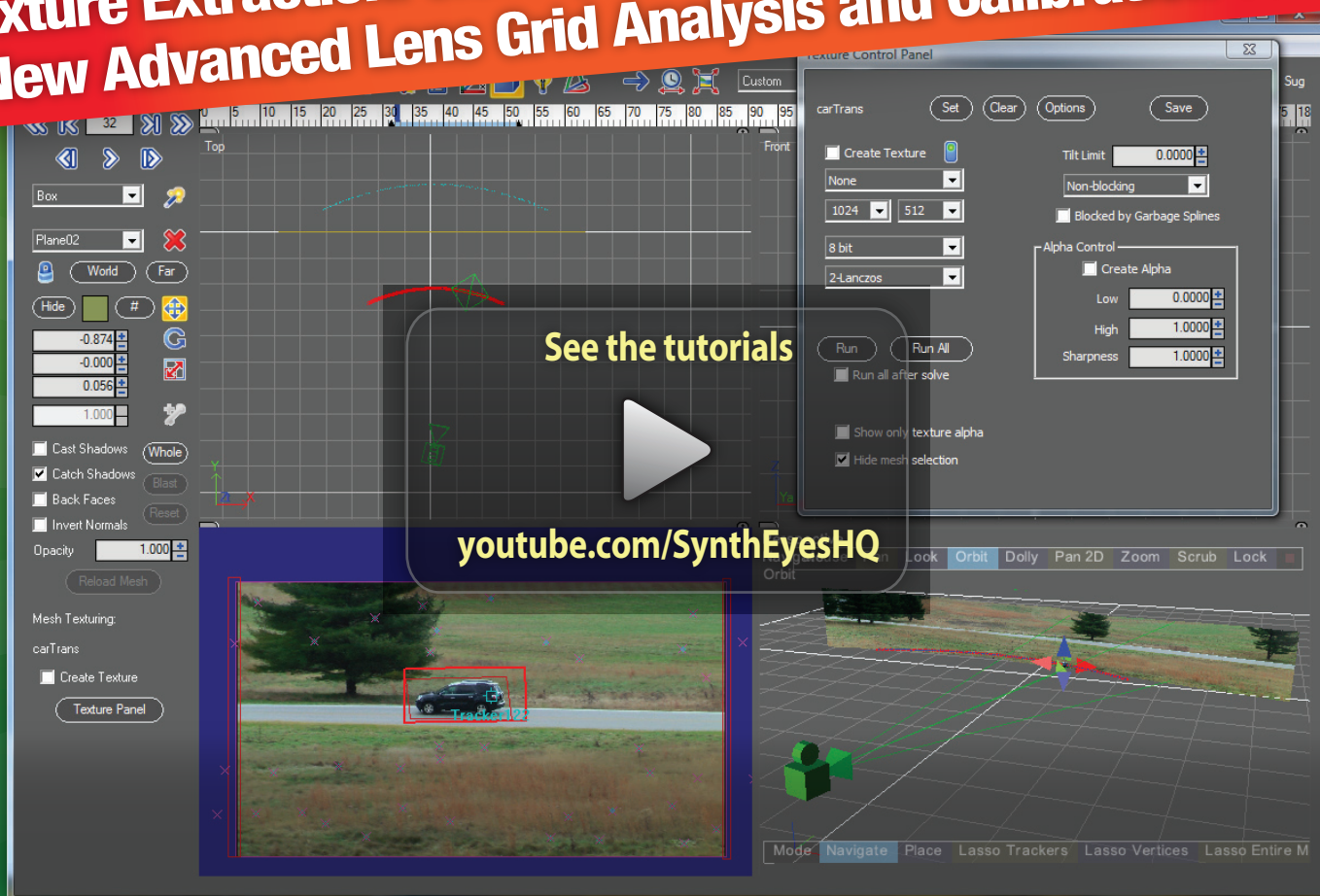




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Over the last couple of years, modeling realistic 3D heads and busts has become really popular. In this series we will be shown how to do this using 3ds Max, Maya and ZBrush. From the basic head model and a highly detailed head sculpt, through to texturing and post-production, our artists will cover every aspect of the creation process, providing us with the perfect opportunity to learn from their experience.

APRIL ISSUE 080 Low Poly Modeling MAY ISSUE 081 Modeling the Features THIS ISSUE Unwrapping

NEXT ISSUE Texturing and Shaders AUGUST ISSUE 084 Hair and Clothing SEPTEMBER ISSUE 085 Rendering and Lighting

CHAPTER 03 – UNWRAPPING

Software used: 3ds Max

Now that I have my head model done and detailed in ZBrush, I need to prepare the UV, in order to be able to texture it.

I like to have two or three textures for a face, for better quality. On this one I will only use one, so I don't have to deal with multiple UV seams and I will just use a big texture to get the quality detail I want (probably a 5K).

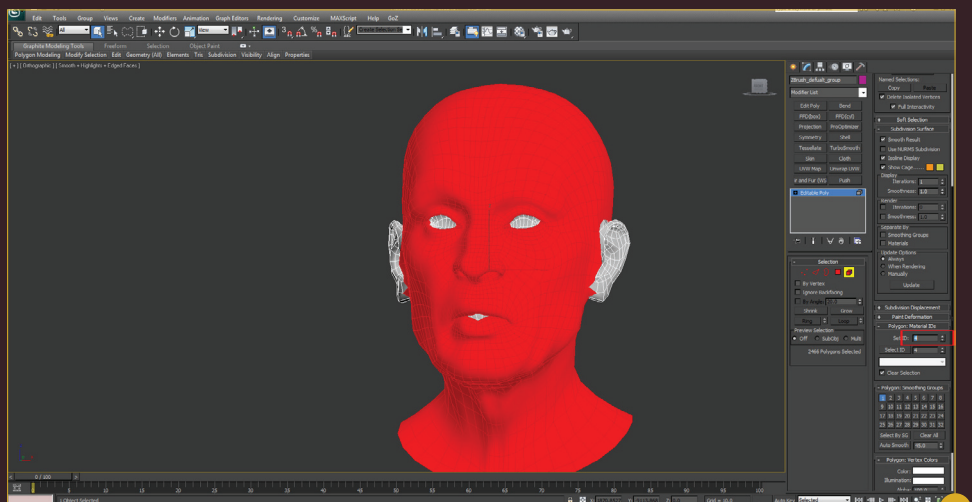
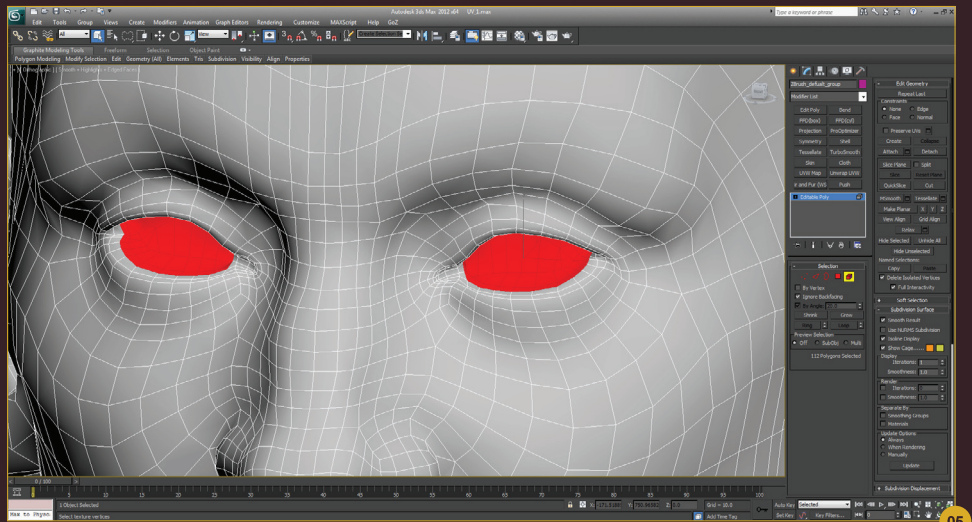
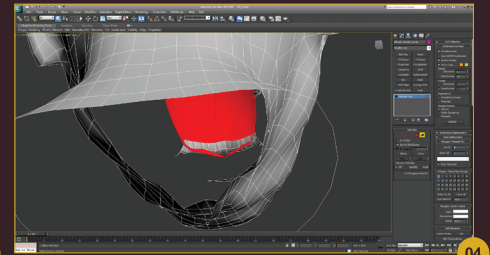
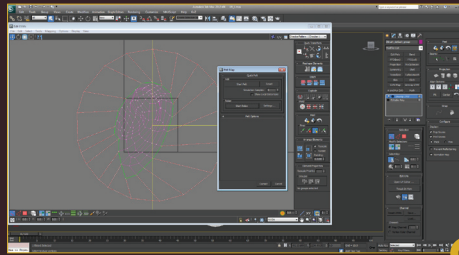
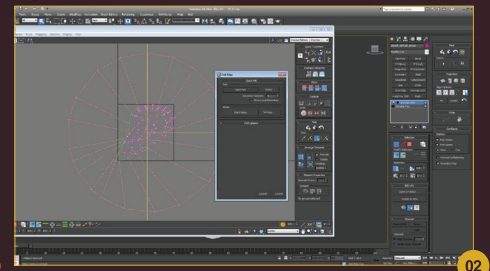
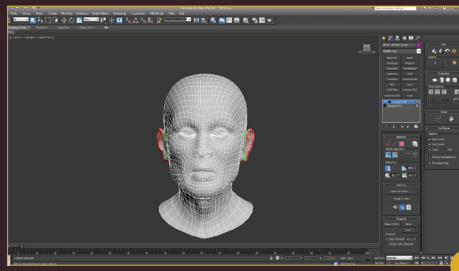
I did the ZBrush sculpt before the detailing, because I knew I would deform and move the model a lot, and I wanted to do the UV unwrap on the final version of the face model.

I like to do my UV unwraps inside 3ds Max. The Pelt tool works very well most of the time and I prefer to not have to bounce from one software to another all the time; I like to stay in 3ds Max as much as I can. I feel I go faster this way, but it's really just a personal preference.

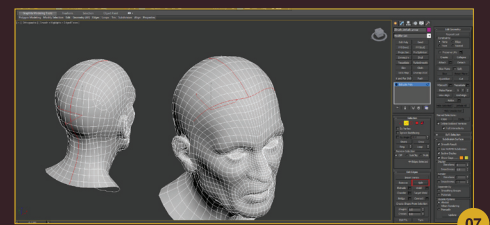
To start I generally select different parts and start unwrapping them separately. I don't detach anything; I only select the polys I want to start unwrapping then apply the Unwrap UVW modifier with the polys selected (**Fig.01**) and then click directly on the Pelt tool (**Fig.02**). Here for the ears, I only had to click on Start Pelt and then Start Relax to get a good UV unwrap (**Fig.03**).

I do that for each ear, then with the same process I move on to the mouth bag (**Fig.04**) and the eye bags (**Fig.05**), and use the Pelt tool again to unwrap the UVs.

For the face I do it a bit differently. I select all the polys – minus the ears, the mouth bag and the eye bags (they are already unwrapped) – and I apply a different ID number, to have a quick selection (**Fig.06**). So now all the unwrapped UVs are on ID 4. I do that just to have quick access to this particular poly selection.



I then select the edges where I want my UV cuts and click on Split (**Fig.07**). Next I select only half of the polys on the face, add an Unwrap UVW modifier and click on Pelt. I don't start the pelt or do the relax part, but instead do the same process on the other half (**Fig.08**).



Once done, on the two halves I apply a new Unwrap UVW modifier on the two parts, but I don't use the Pelt this time. Instead I select all the UVs on the face, apply Relax by Center (Fig.09) and stitch the two parts together (Fig.10).

I'm not worried about the stretched results because I know I will use the Relax tool and will deform the UVs with Soft Selection. I do the same for the bottom part of the face and again use the Relax tool (Fig.11 – 13).

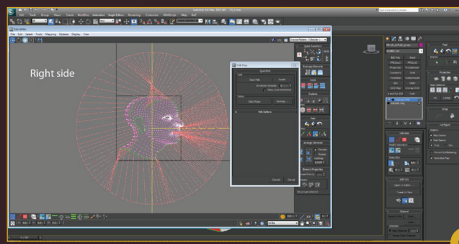
I use the Soft Selection tool to deform the Unwrap and get the shape I want. I won't show the back of the head of my character, so I want more UV space for the face part (Fig.14 – 17).

My unwrap is almost done. I now apply a checker to my model to see where I need to polish the UVs more and change the tiling. In this case I use 15 on U and V to have smaller black and white squares (Fig.18).

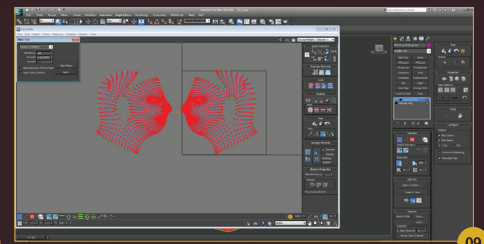
I use the Soft Selection tool again and this time use the Move and Scale tool too to get a more even look to the checker on my model. I use the Relax by Center tool on the eyes and mouth to be sure none of the UVs are overlapping (Fig.19).

A few more tweaks, still using the Move tool, with Soft Selection on and I get an unwrap that I'm somewhat happy with (Fig.20). It seems like a lot of steps, but actually it's done very quickly and I have good control over my UVs. I used to use Unfold3D or UV Layout, but now at work and at home I do 90% of my unwraps in 3ds Max.

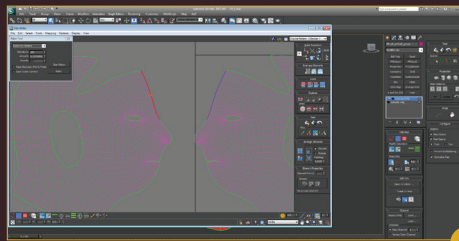
Before starting working on the hair and clothing I want to move on to the small medals that my character will have with his necklace. After gathering some references, I start modeling very simple geometry (Fig.21). Using the same process for the face, I do a quick unwrap of every piece, mostly using the Pelt tool and



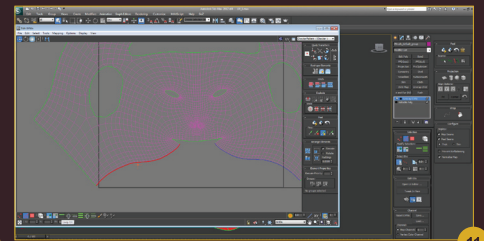
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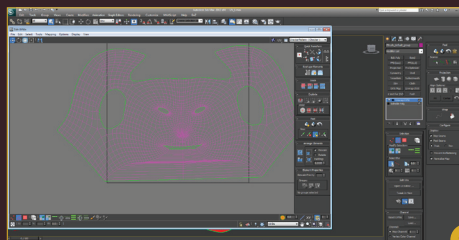
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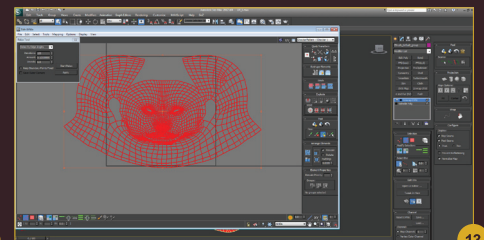
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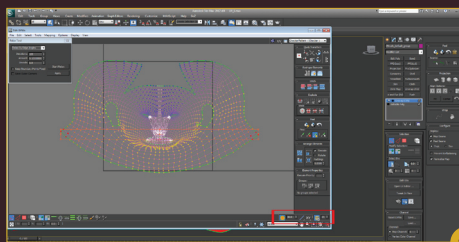
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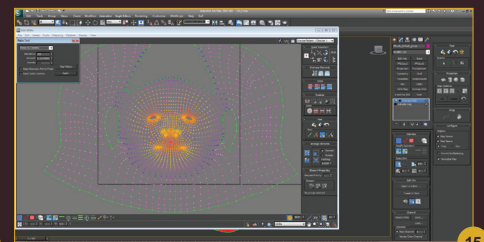
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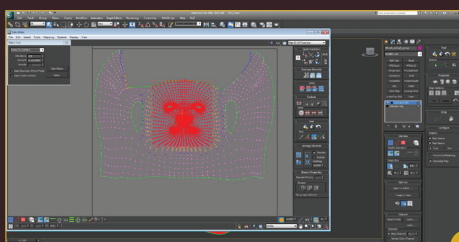
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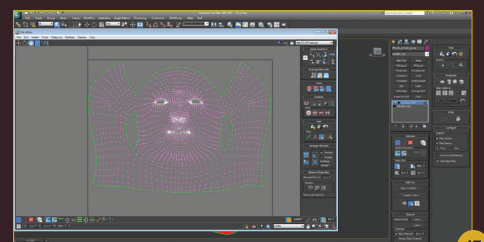
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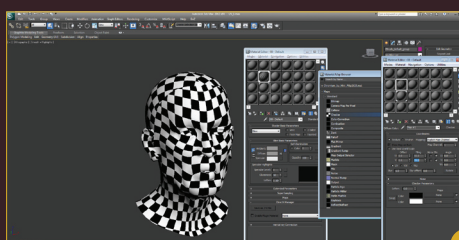
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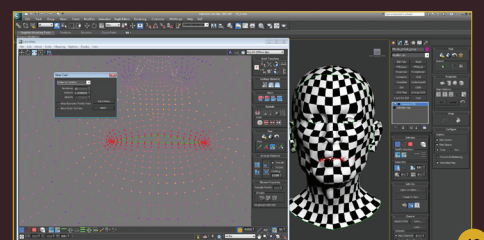
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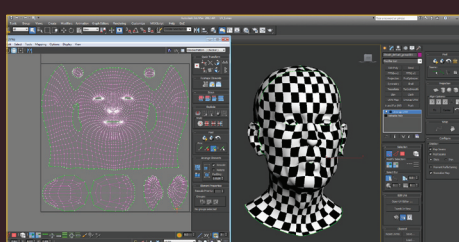
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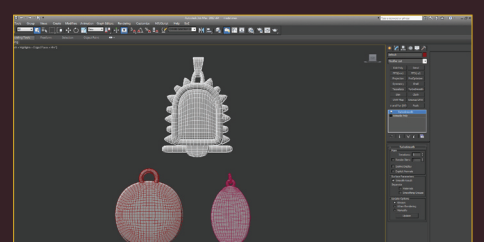
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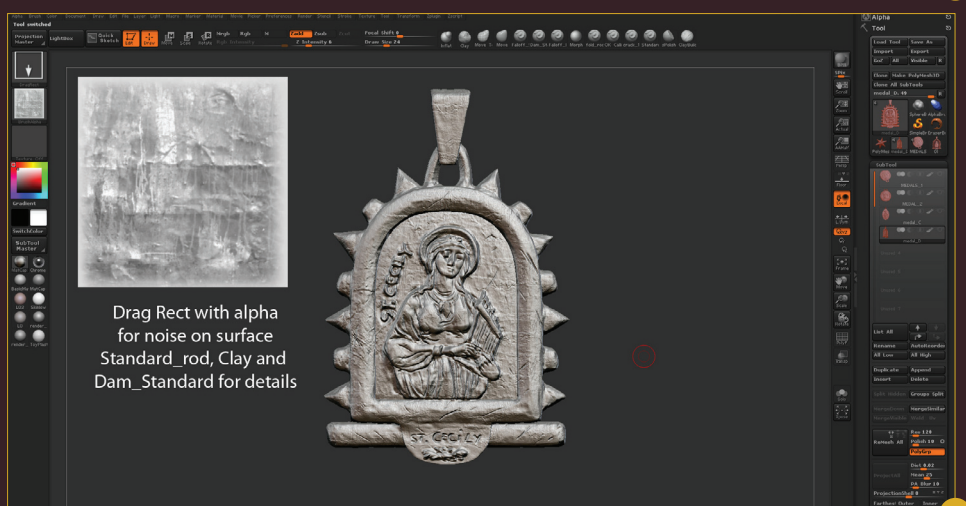
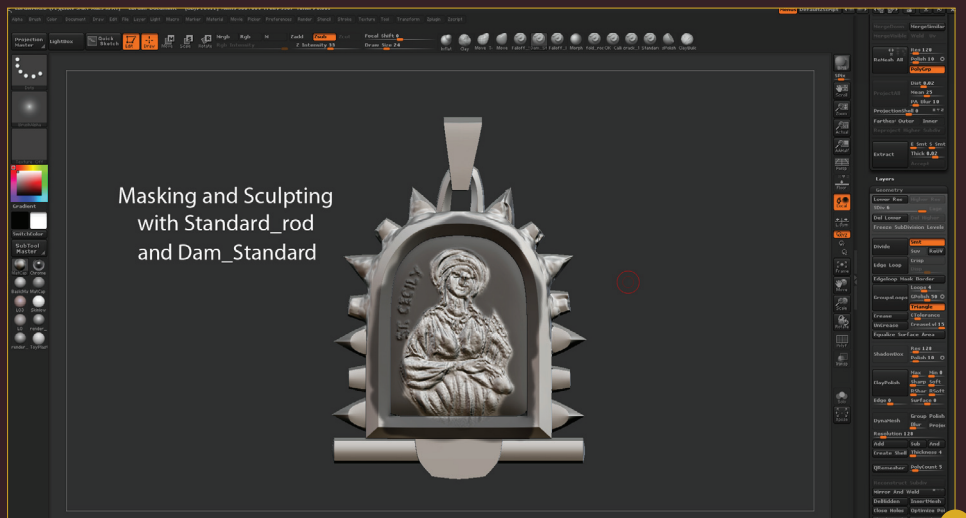
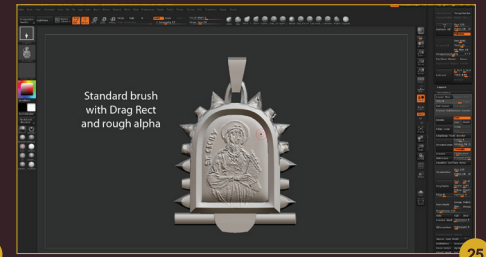
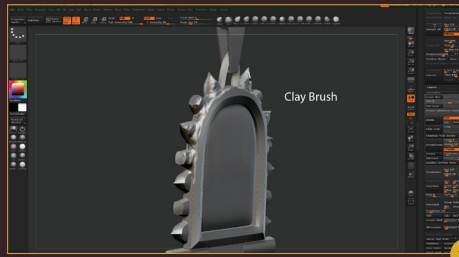
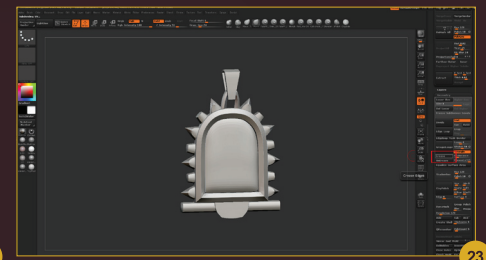
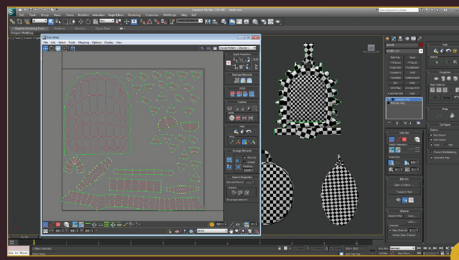
focusing on having more UV space for where the majority of the sculpt will be (Fig.22). Each piece of the medal is a separate element, not physically connected to the rest of the medal. It makes the UV unwrap faster and I know I will get a blended/melted effect once in ZBrush.

I import the meshes into ZBrush and before adding divisions I click on the Crease button (in the Geometry panel) (Fig.23). This will keep my hard edges hard and even if it might look like too much, I do that on purpose to kind of force me to go and sculpt every part with the symmetry off and to be sure I won't get a rubber effect.

Now with only the Clay brush I start sculpting the medal, breaking the hard edges and making all the elements look like they have been melted and put together as they would have been in real life (Fig.24).

For the center piece I create a rough alpha. I want to have a rough look for the medals – very old and used – so my alpha is more to get the overall idea of where the details will be (Fig.25).

Then I mask the shape and use the Standard_rod and Dam_Standard brushes to start detailing the figure (Fig.26).



I knew the medals would be small and a bit out of focus so I try to go fast on them and not spend too much time detailing them. Once I'm happy with the central piece I start using one of my alphas to get the scratched and used look I want to have for the medals (Fig.27).

I use the same process on the other medals and I'm now ready for the next steps (Fig.28).

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CHARACTER PRODUCTION



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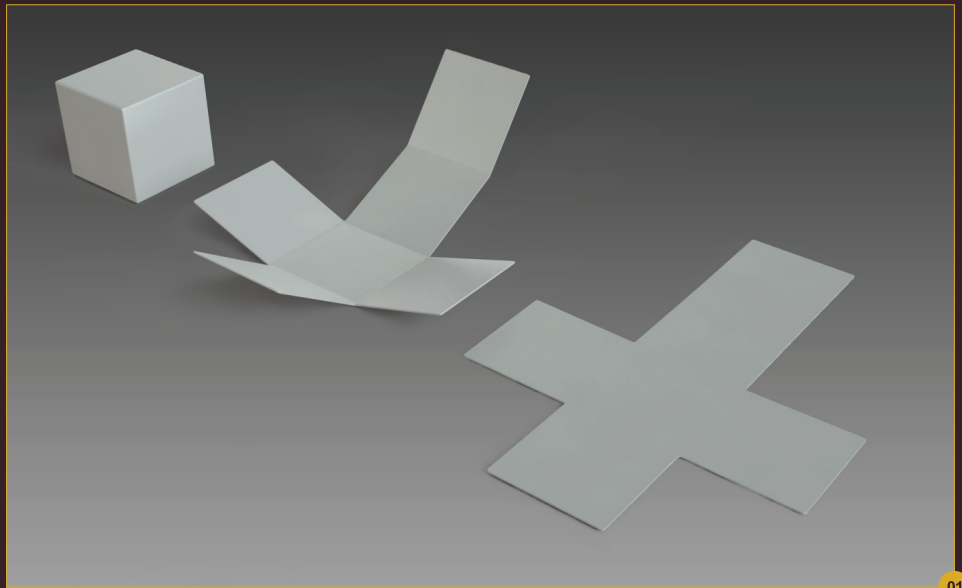
CHAPTER 03 – UNWRAPPING

Software used: Maya

In the last two tutorials we have covered the creation of a head model, using some simple modeling techniques in Maya. So the next step is to prepare the model for texturing.

The most common way is UV mapping, so before we start I will try to describe what UV mapping is. UV mapping or unwrapping is a way of representing a model in 2D space, so it can be used as coordinates that will correspond to the 3D version of the model.

In other words it's a model unfolded and flattened onto 2D space. The simplest way to understand this concept is to imagine a simple paper box you want to unfold and flatten onto a desktop (**Fig.01**). The same concept can be applied to geometry of almost any complexity.



01

There are a few rules that need to be followed during this process. To unfold any model, we have to make cuts, or rather seams, in order to produce less distortion on the flattened model. More seams can often lead to less distortion, but the downside to that approach is that those

seams will show as discontinued texture edges, so the best approach is a good balance of both.

It's also important to say that UV space is 1:1 square ratio and in order to maximize texture space, it's important to keep UV chunks or islands packed tightly and fitted in that range.

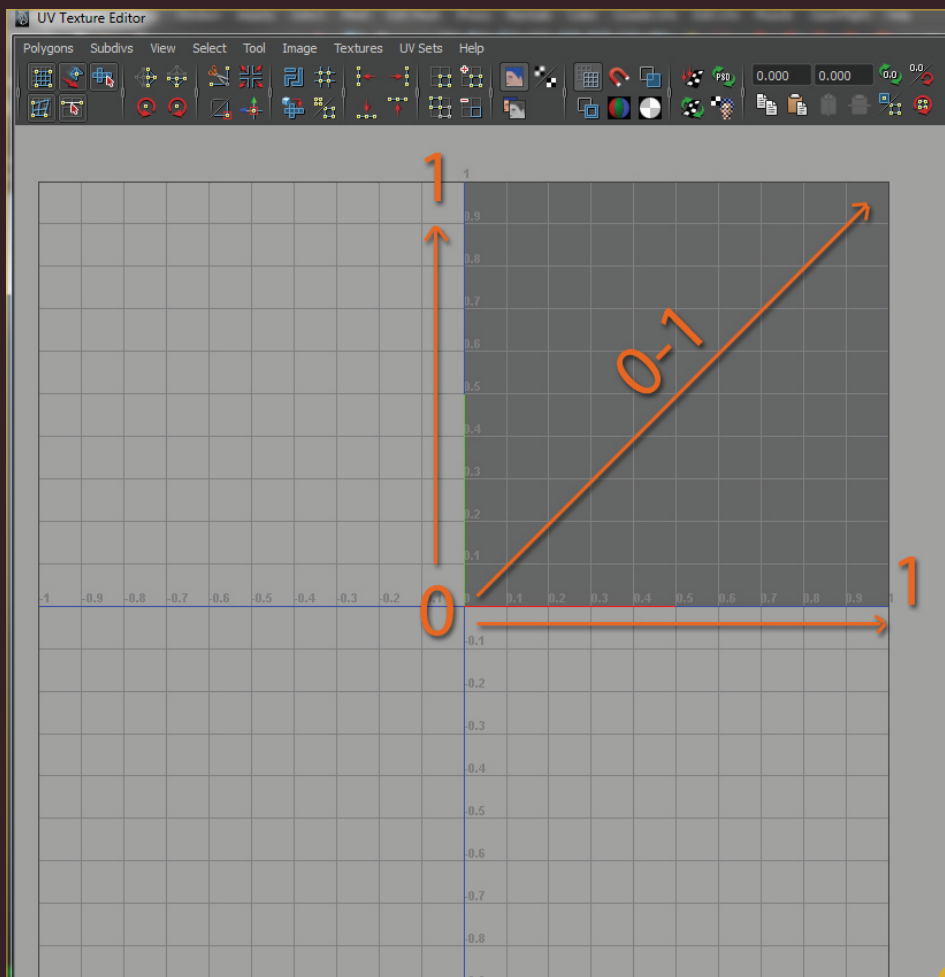
Standard UV space ranges from 0-1 in a U direction and 0-1 in a V direction, and it's often referred to as 0-1 space (**Fig.02**).

Every UV piece has to have its own space; no overlapping is allowed, except two or more pieces that are identical and destined to use same texture.

In that space, U refers to horizontal coordinates and V refers to vertical coordinates. In the same way 3D is described by X, Y and Z.

With that being said, let's move on to unwrapping the head we previously modeled. The fact that we have built a model symmetrically will pay off through every step of creation, especially the process of laying out UVs. Therefore we don't need a symmetrical side of the head, and the first step is to delete it.

Once we have completed the UVs for one half of the head, we will mirror it over to the other side.

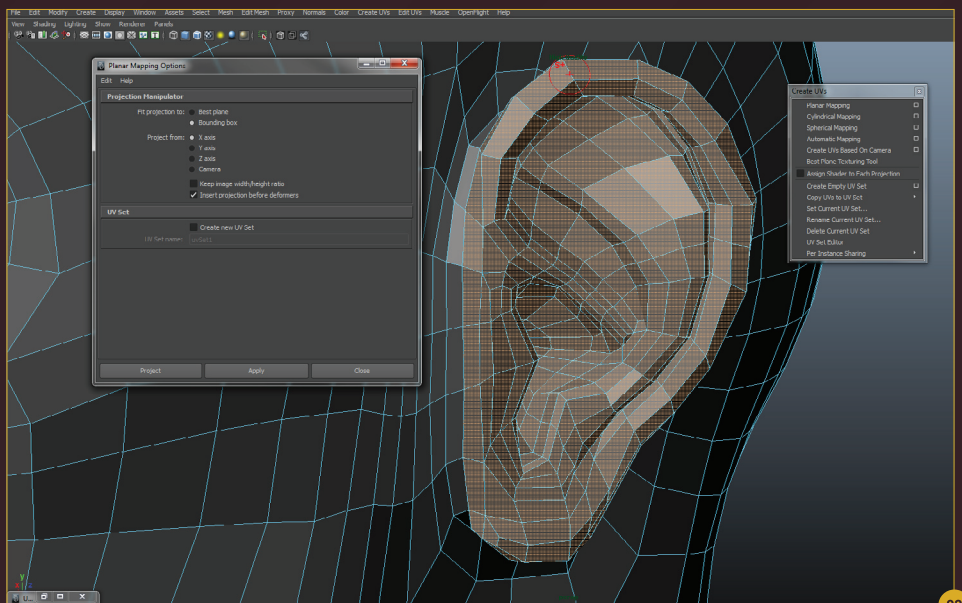


02

Along with geometry, UVs will be copied too and all that's left is to mirror the UVs and to stitch the two UV shells together.

The second part of the plan is to separate some parts in UV space, like the ears and the mouth bag and unfold them separately. Keep in mind that models in UV space can be in as many pieces as necessary.

Let's start with the ear. Select the polygons of the ear (**Fig.03**). The selected polygons are mostly facing planar to the side view and we will use planar projection as a starting point for this part.



03

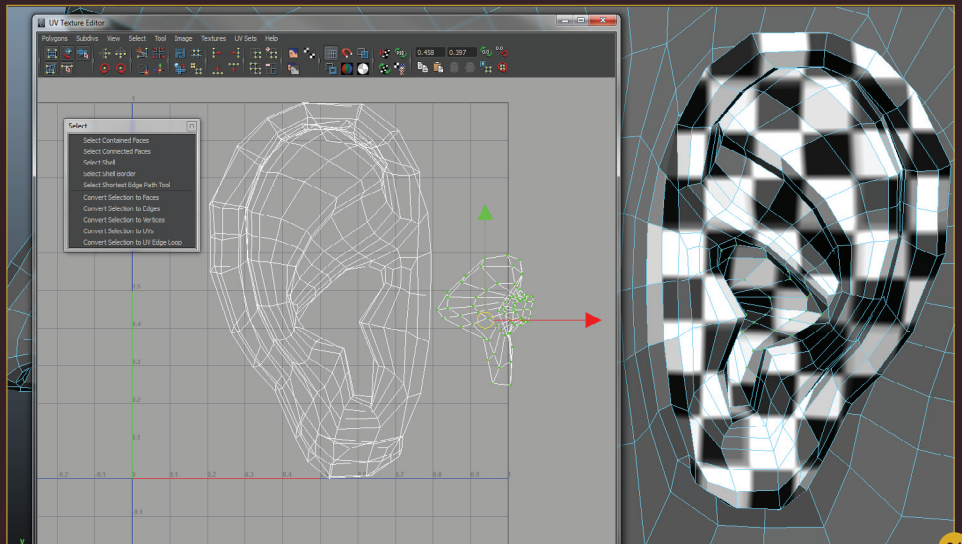
Go to the Create UVs menu and select Planar mapping to make an initial projection. To preview how your texture will be applied to these coordinates, let's apply a checker texture to this part.

Make a simple blinn material and connect checker texture to color. Also, in a 2D placement node, make it repeat five times. You can select unwrapped faces directly from the UV Editor and apply the material to the selection.

As you can see, the squares on the checker are a bit stretched because initial planar projection has made the projection plane perfectly square. To fix this, select UVs from the UV Editor and rescale it by simultaneously watching over a texture in a 3D view, until you make the checker texture on the ear almost perfectly square.

Planar projection has done a pretty good job, except for a few areas that are overlapping or facing away from the projection, so the texture is stretched. So let's deal with those issues.

First let's detach the ear canal and move it out of the way. In the UV Editor, select one edge inside the ear canal and from the Select menu press Convert Selection to UV Edge Loop. From now on the Select menu will be used frequently, so detach it to make it a floating menu.



04

To make the cut, go to the Polygons menu in the UV Editor and choose the Cut UV Edges option. The ear UVs are now separated into two shells and to move the ear canal out of the way, select one polygon from that shell and press Select Shell, then Convert Selection to UVs. Now you can move the separated piece to the side (**Fig.04**).

With the ear canal shell selected, go to the Tools menu and then select the Smooth UV tool. From there you will be presented with two on-screen menus, one called Unfold and the other called Relax. Both of these are smoothing options. My strategy is to apply Unfold, then Relax, in small increments until I get rid of all the overlapping.

You can also move vertices in UV space one by one and help those two algorithms to better understand what you are up to. After unwrapping that part, rescale the shell to approximately the same texture space as the ear shell. In order to do so correctly, use 3D View to match the checker size on both shells.

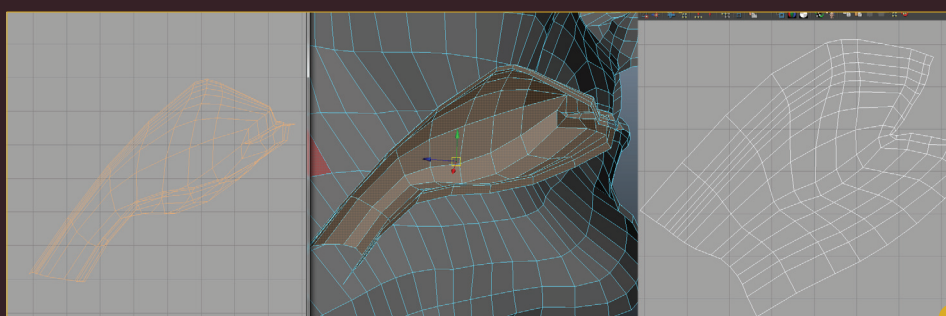
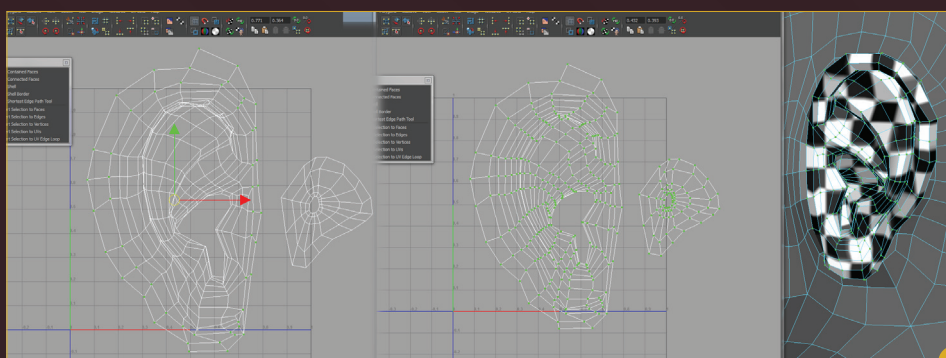
Now let's concentrate on the ear, which is the much more complicated part. In order to use the Unfold and Relax technique correctly, we need to make some unfolding by simply moving some vertices into the UV Editor. So let's start with that parts that are most obviously overlapping, such as the outer edge of the shell. To select the shell border, select one of the outer vertices and press Select Shell Border.

Deselect the inner border, since we will concentrate on the outer edges of the shell first. To move selected points out of the way, we will use the UV Smudge tool, which is essentially a move brush with a nice falloff. Once you move these points to their own UV space, grow the selection once (Shift >) and repeat the same process again.

Now let's deal with the rest of the overlapping vertices by selecting them in small groups and relaxing. Make sure to constantly monitor the behavior of the checker projection in 3D view, to prevent any major texture distortions (**Fig.05**).

Since the ear is complicated in both topology and shape, making perfect distortion free coordinates is close to impossible and texture stretching is tolerable on this part, since most of its look in final rendering will come from its shape and sub surface scattering shading.

Once unwrapped, select both parts and move them out of the way to make room for the next piece. Now select all the polygons of the mouth's interior and make sure that no polygons are selected that are visible from the outside. That way we will prevent any visible seams.

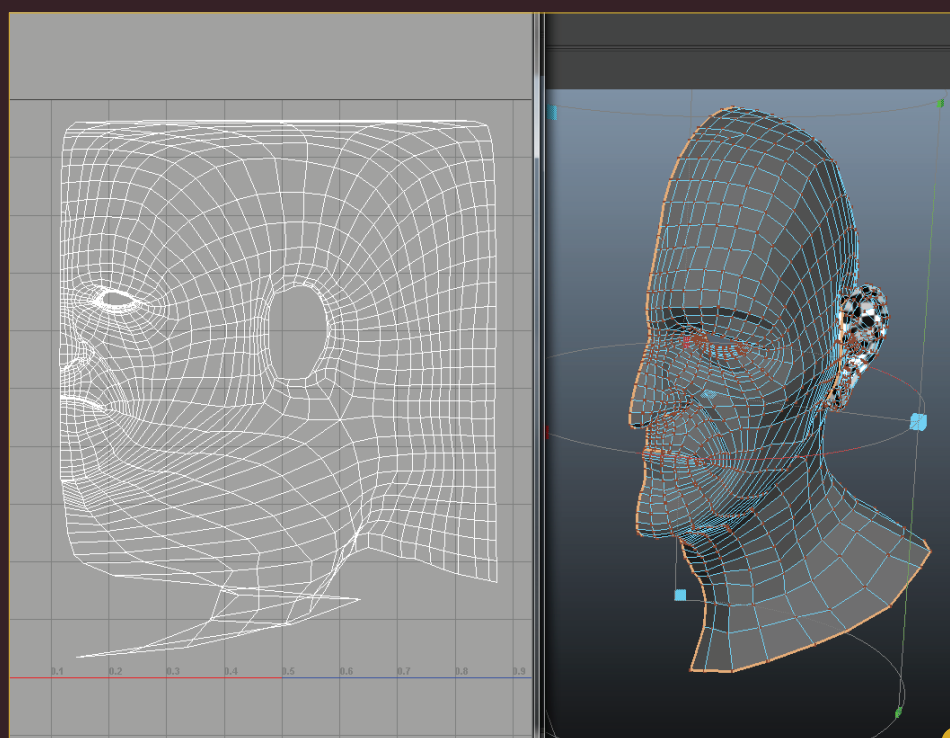


Apply planar projection also on this part as a starting point and apply a checker material also. Select UV Shell and apply the Unfold option all the way to the maximum. Use the UV Smudge tool to deal with any overlapping remaining (**Fig.06**).

Repeat the same process for the geometry inside the nose and move the unwrapped parts out of the way. Now we are left with the main

part of the model. To easily select the remaining part, go to the UV Editor and select all the unwrapped pieces, then go to Edit and choose Invert Selection. With this area selected, go to the Create UVs menu and select Cylindrical Mapping.

Since the shape of the head closely resembles a cylindrical shape, this is the best starting projection we can get.



Here comes a tricky part. Because we have deleted half of the head it's no longer fully cylindrical, but half of it. This issue can be easily fixed by rotating and moving projection in 3D view by using a projection gizmo (**Fig.07**).

Here is where the checker texture will be most valuable because we will constantly refer to it in a 3D view, while correcting distortion and overlapping in the UV Editor.

Apply the checker texture to the whole model and resize the checker size by setting up more repetitions in a 2D texture placement node. Between 30 and 50 repetitions would be a good number of repetitions. Resize all the other unwrapped parts to roughly match the checker size with the head.

If you have done everything right by now your checker projection should look like this (**Fig.08**). As you can see there is some obvious stretching of texture in some places, so let's deal with those major issues first.

Stretching in general occurs at places where the size of the polygons in the UV Editor doesn't match the size of the same polygons in 3D view. Our job is to make those differences as invisible and as minor as possible.

Let's correct the most obvious part at the neck. Use the UV Smudge tool to space out overlapping vertices as much as possible, then select points in small groups of up to 10, and apply Unfold and Relax smoothing alternately. Repeat the process for all of the neck area until you remove most of the distortion. After that select all points in the neck area, except ones at the border, and repeat unwrapping and relaxing. Similar to the neck area, the top of the head will also have significant distortion, but since it's not going to be visible at all, don't spend much

time on it. Just select the top vertices and apply Unfold smoothing.

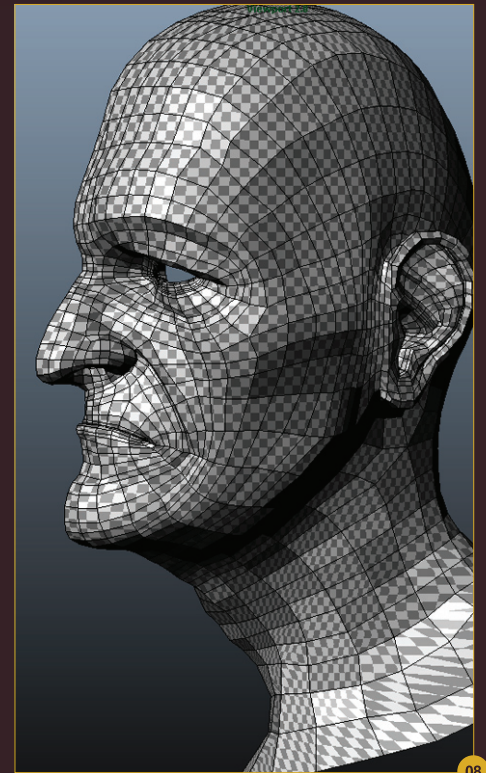
The next problematic area is the mouth, where we have some overlapping. The best approach to this area is to move the points one by one, since there are few of them.

Here is what I came up with after applying the last few steps (**Fig.09**).

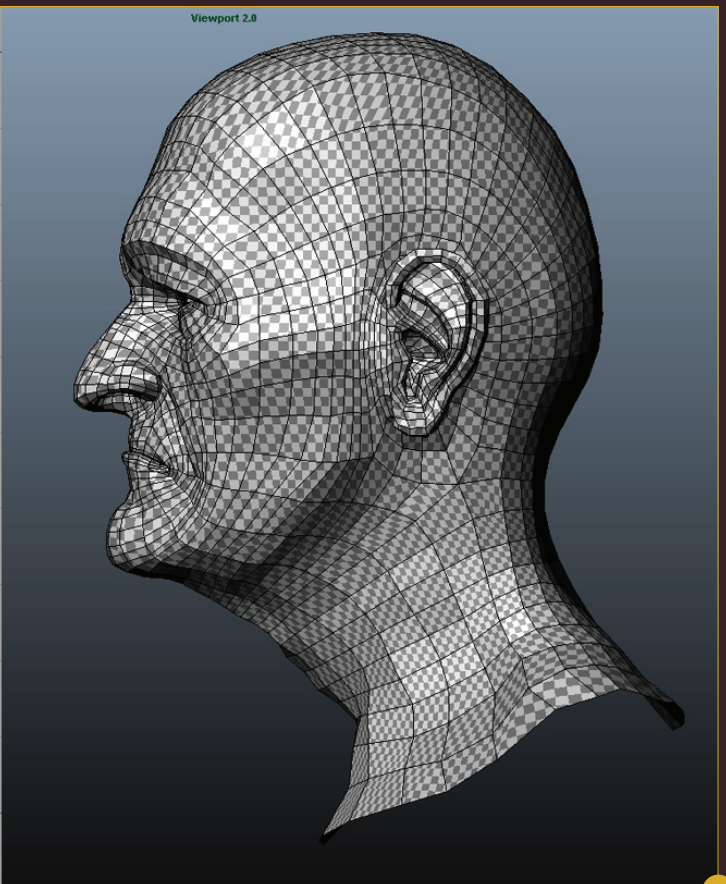
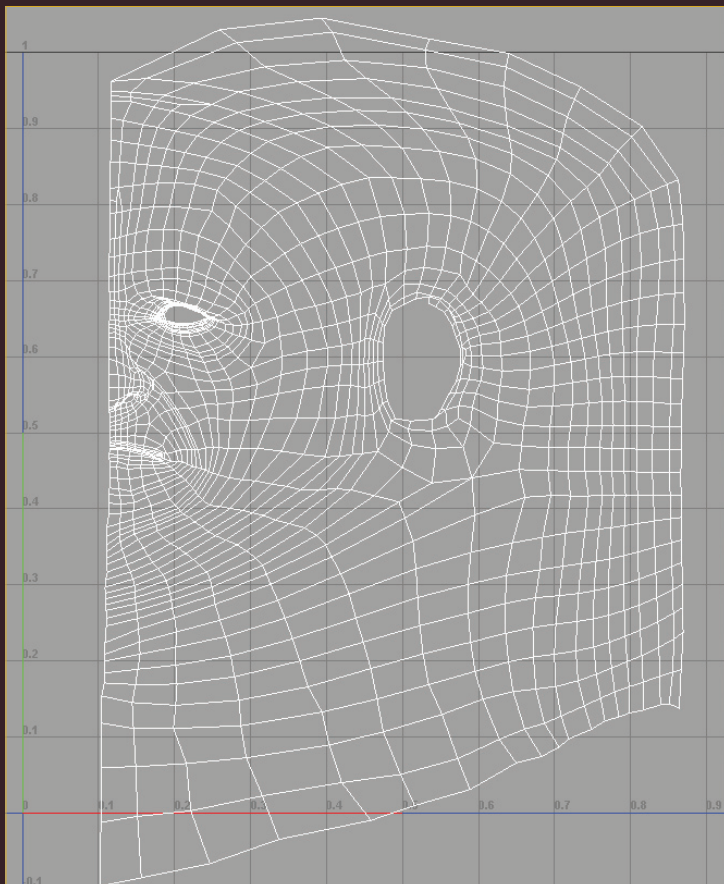
Using a similar approach, relax the areas on the nose and eyes too. Detach the inner part of the eyelid, as it's not going to be visible and it will be easier to unwrap the eye without that part. Try to maintain the shape of the eye in the UV Editor; it will be much easier to draw in 2D when you have them similarly shaped in both 2D and 3D.

After completing UVs for half of the head, it's time to mirror all this work to the other side.

Before mirroring, align all the points at the middle of the head in the UV Editor, so they are aligned vertically.



Go to the Mesh menu and select options for mirroring the geometry. Make sure that the Merge with the Original option is unchecked and Apply.

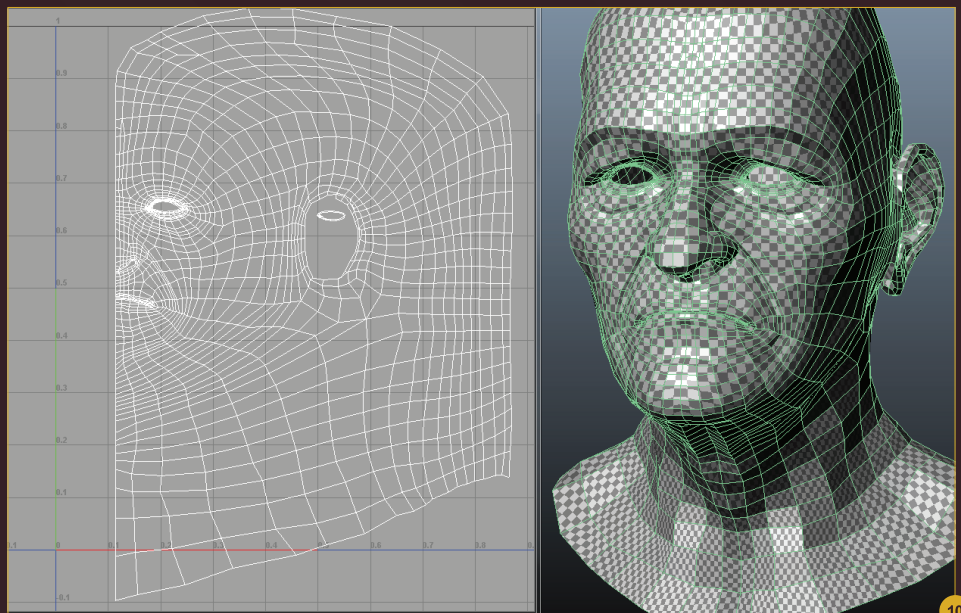


Select the vertices at the middle of the head and go to the Edit Mesh menu. From there select the Merge Vertices option and set Threshold to 0.0010 and hit Apply.

Now you have the whole head unwrapped and both of the sides are using the same UV space, which means that the texture applied to the one side will also be applied on the other side, but it will be mirrored. That can be good in some situations, like in game models, but for this purpose we will make both of the sides use their unique UV space (**Fig.10**).

Using a 3D view, select one polygon from the mirrored side and in the UV Editor go to Select Shell. With the mirrored shell selected, choose Flip from the Polygons menu in the UV Editor and finally, from the Select menu, use Convert Selection To UVs. Now you have selected only UVs for the mirrored side and you can move that shell left to match the other side.

Select edges at the center of the head in the UV Editor, and from the Polygons menu use



10

Move and Sew UV Edges to stitch the two parts together (**Fig.11**). Also make sure to flip the shells for the ears, mouth interior and rest of the pieces. Stitching both sides together will produce some stretching at the line where both shells for the head are welded.

Before packing all the parts into 0-1 space, invest some more time in relaxing those areas.

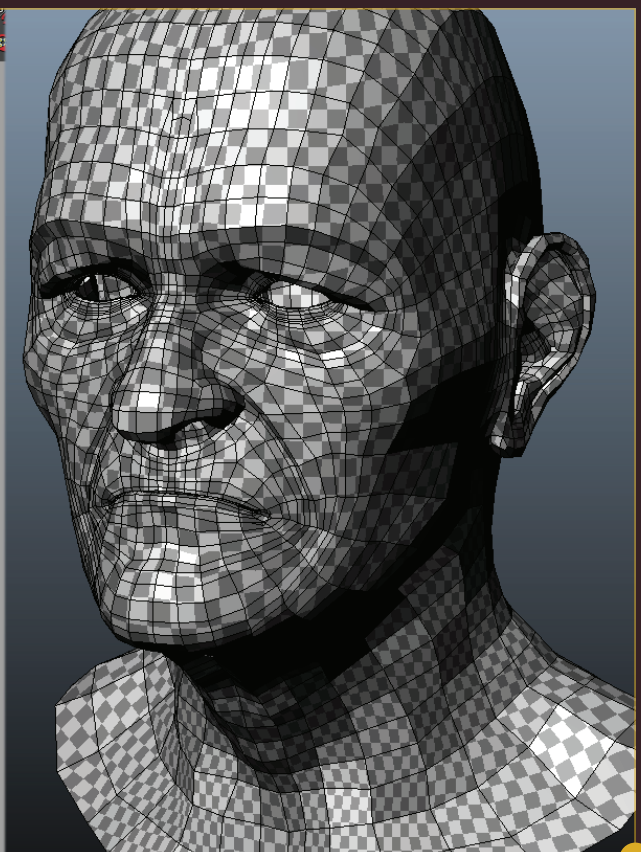
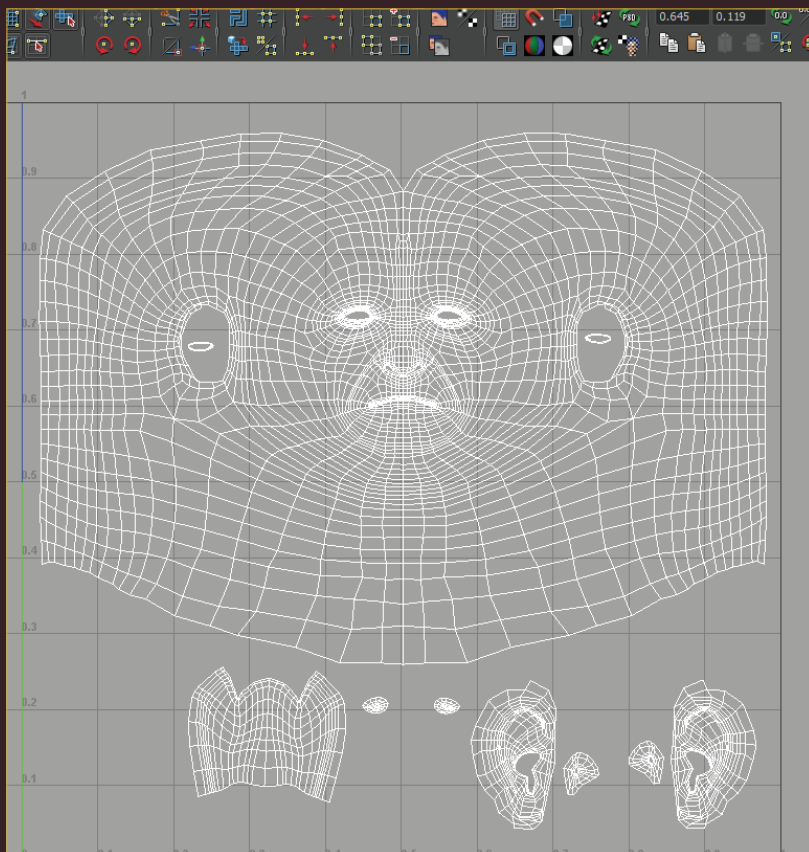
The last step is to arrange all the shells to fit in 0-1 space nice and tightly.

I hope you enjoyed this tutorial and I'll see you next time.

ANTO JURICIC

Web: <http://anto-toni.cgsociety.org/gallery/>

Email: monty.band@gmail.com



11

3DC next month

Here is what's in next months issue of 3dcreative

Tutorials

Guide to FX - Particles and Dynamics

Chapter 4 - Snow
3ds Max & Maya

Building Droids

Chapter 4 - Repair Droid
by Victoria Passariello

The Submarine Pen

Environment Creation Using Unreal Games Engine
Chapter 1 - Concept to White Box
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Totem

Making Of by John Thiry

I am sure you remember John Thiry's extravagant duck scene from the gallery selection in March's issue. This month he walks us through his creation process from modeling to texturing and also looks at the importance of lighting.

"THERE IS
NO RATIONAL
EXPLANATION TO
THIS PICTURE; IT'S
JUST A MATTER OF
INTERPRETATION"

John Thiry
2012



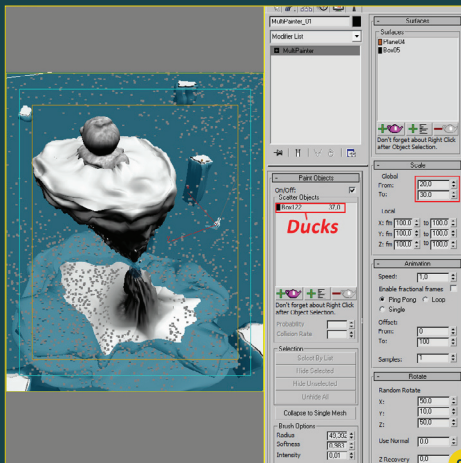
TOTEM

Software used: 3ds Max

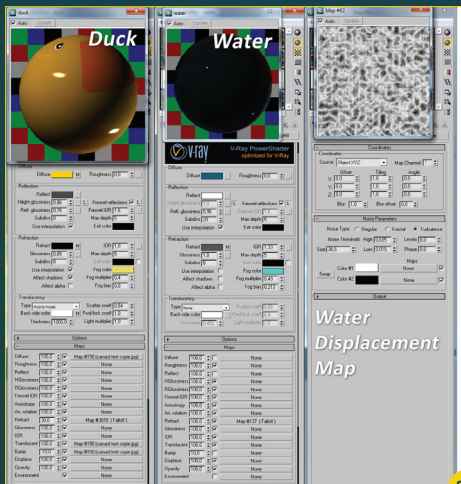
INTRODUCTION

Most of the time when creating a new illustration, I have no idea what direction to take. Initially, this scene consisted of a close-up of plastic ducks in a bathtub, sucked into a maelstrom. Sadly the exercise soon proved difficult and almost impossible due to a lack of hardware performance, but the idea of creating a bit of an extravagant scene with my little ducks was still in my mind. So I headed towards something bigger and wider, where I could use closeness and detail on the one hand, and depth on the other. What is more extensive for my ducks than the ocean!

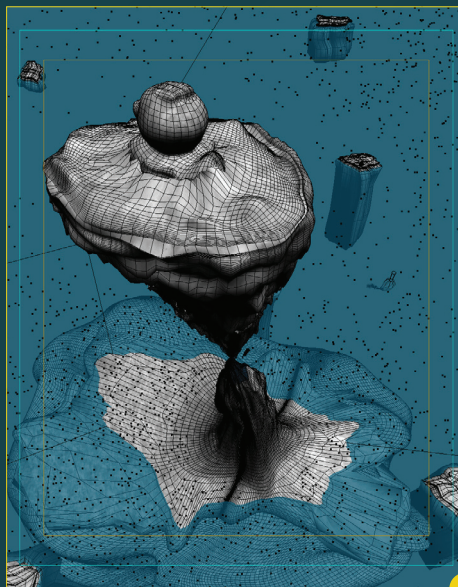
From there I thought through the staging, the atmosphere, the frames and I reached this idea. What does it means? This is probably the



03



04



01

question I get asked the most. There is no rational explanation; I think it's a matter of interpretation. Before, I used to say that there are pictures that tell a story and pictures that have no purpose, other than being pleasing to the eye. My point now is that there is a bit of both in every picture.

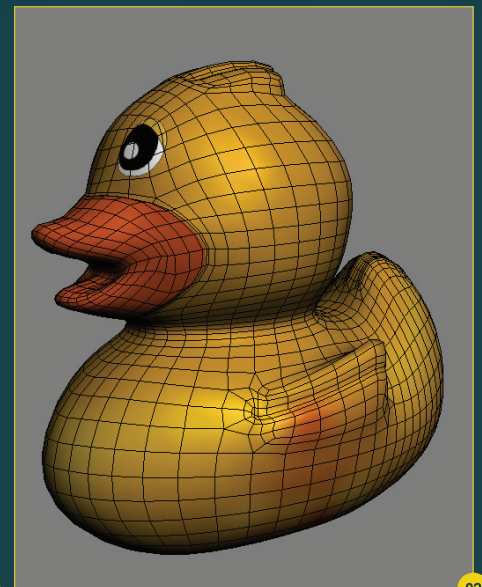
MODELING

Often in my 3D designs, the modeling is quite simple and basic; however I do not skip on the reference images, in order to remain consistent. I used a hemisphere for the environment and a plan for the water. For the icebergs and ducks, it was purely box modeling. So, with edit poly, I moved the vertices and added segments (**Fig 01 – 02**). As I said, it was very basic!

Still, note that I used the Paint Deformation tool for the main iceberg, to add more detail where I considered it to be important. This tool is a good alternative to the 3ds Max Noise Modifier tool, because it makes it easier to add depth and relief in a less random way. Be careful not to abuse it though, at the risk of littering the model. You'd be better off using an Edit Poly modifier and adding TurboSmooth to add vertices, rather than working at the "base" of the model.

Finally I used the wonderful MultiPainter tool.

The Scatter Object is the duck model converted



02

to a V-RayProxy and the surfaces are the water, of course, and the main iceberg (**Fig.03**).

TEXTURE

I always enjoy spending time on this step. At this point I used V-Ray materials, which are easily configurable and very intuitive. Then I roughly put in the main light sources, to visualize the reactions of the different materials better.

For water, the tricky part here was the refraction. Many test renders were conducted to get the desired result (a beautiful semi-transparent turquoise). So I played a lot with the intensity of the Refraction, the Fog color and Fog multiplier. Initially, to reduce the rendering time, a Noise map was placed in the bump slot, but the lack of detail quickly led to my decision to use a nice Displacement map on a V-RayDisplacementMod. The detail level here was controlled with the Levels parameter of the map.

For the ice I tried a lot of different configurations with the Displacement map, which consumed a lot of rendering time. The blue/green color was generated by the refraction and translucency.

In the end, the only painted texture was the one for ducks! This was also the only object with the hemisphere, created for an environment that required UVW mapping (**Fig.04 – 05**).

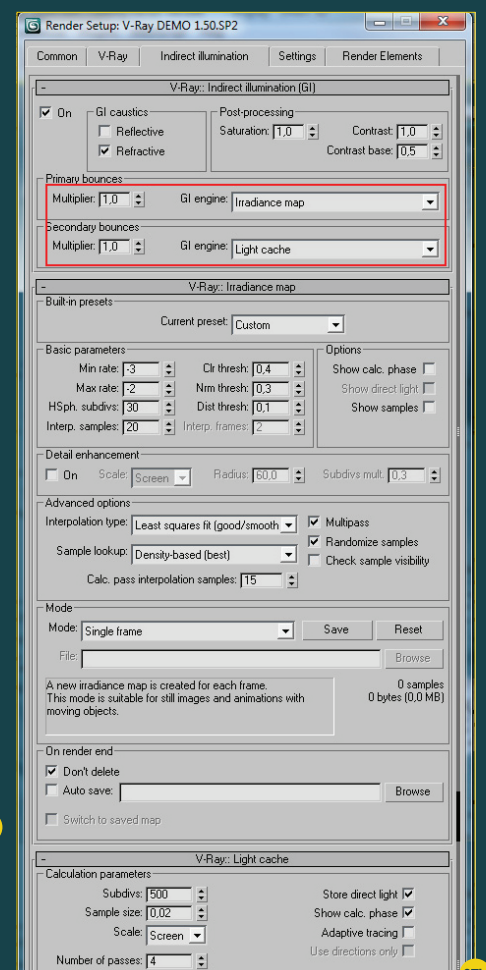
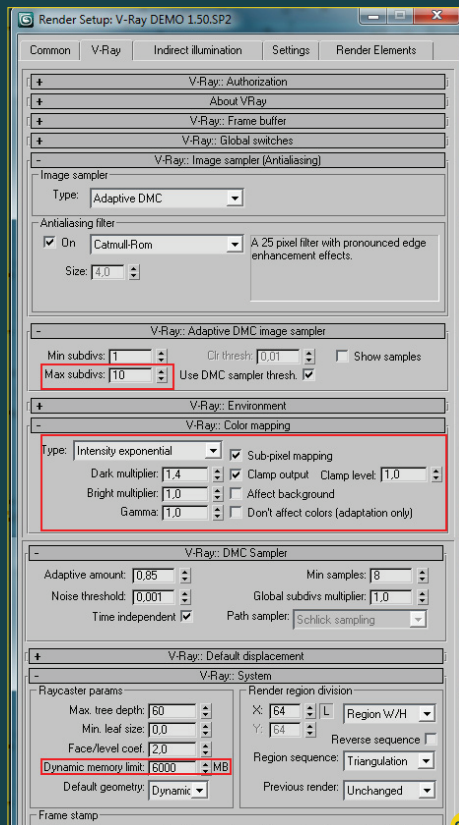
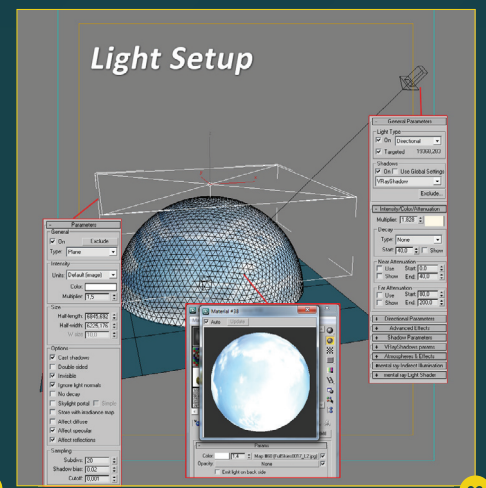
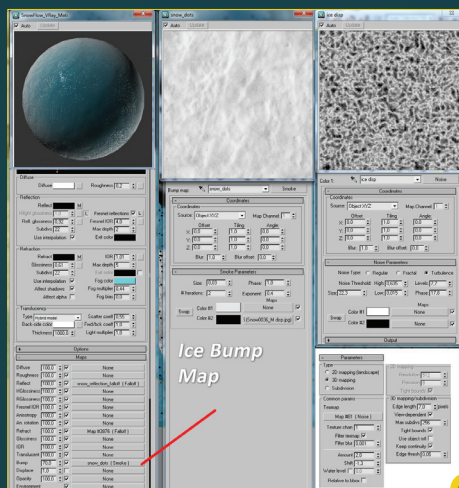
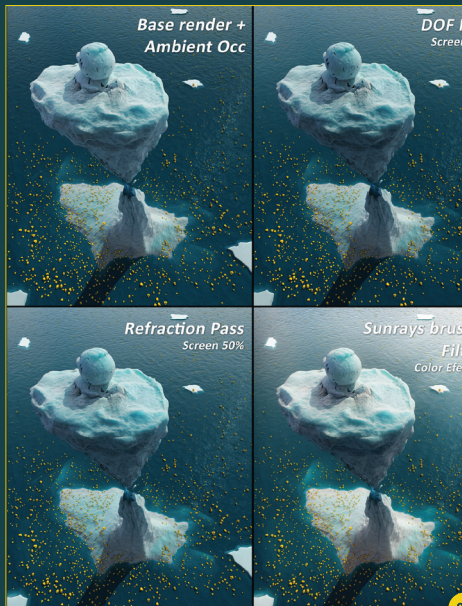
LIGHTING AND RENDERING

The principal light source is a direct light, which simulates sunlight. I could have used a V-RaySun, but I find that simple light is easier to use and without a V-RaySky it is almost pointless. My sky here is the hemisphere with a V-RayLightMtl and a sky texture from www.cgtextures.com. It is a good technique to create outdoor scenes and is also quite fast. Finally, I added a large V-RayLight at the top of the scene to add more reflection and specularly (Fig.06).

I faced some troubles with the rendering. I used Light Cache and an Irradiance map with medium settings. The Max Subdivs parameter was used to control the noise level on the final render.

Due to the pervasive Displacement maps, I had to increase the memory limit (Fig.07a – b).

At the end, with my Core i7 and these settings, the render (2000 pixels width resolution only)



took about 10 hours. At least I had no bad surprises!

POST-PRODUCTION

This step was quite quick. As always, I rendered out Occlusion and Depth of Field passes. I also made some corrections with the Refraction pass, and used Photoshop's Burn/Dodge tool to increase the light and dark areas (Fig.08).

The final (and most annoying) step was to add some foam at the base of the ducks with a small, noisy brush (Fig.09).

CONCLUSION

As I said, there is no rational explanation to this picture; it's just a matter of interpretation. As Edgar Degas said, "Art is not what you see, but what you make others see." What do you see?

JOHN THIRY

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Email: greendjohn@hotmail.com



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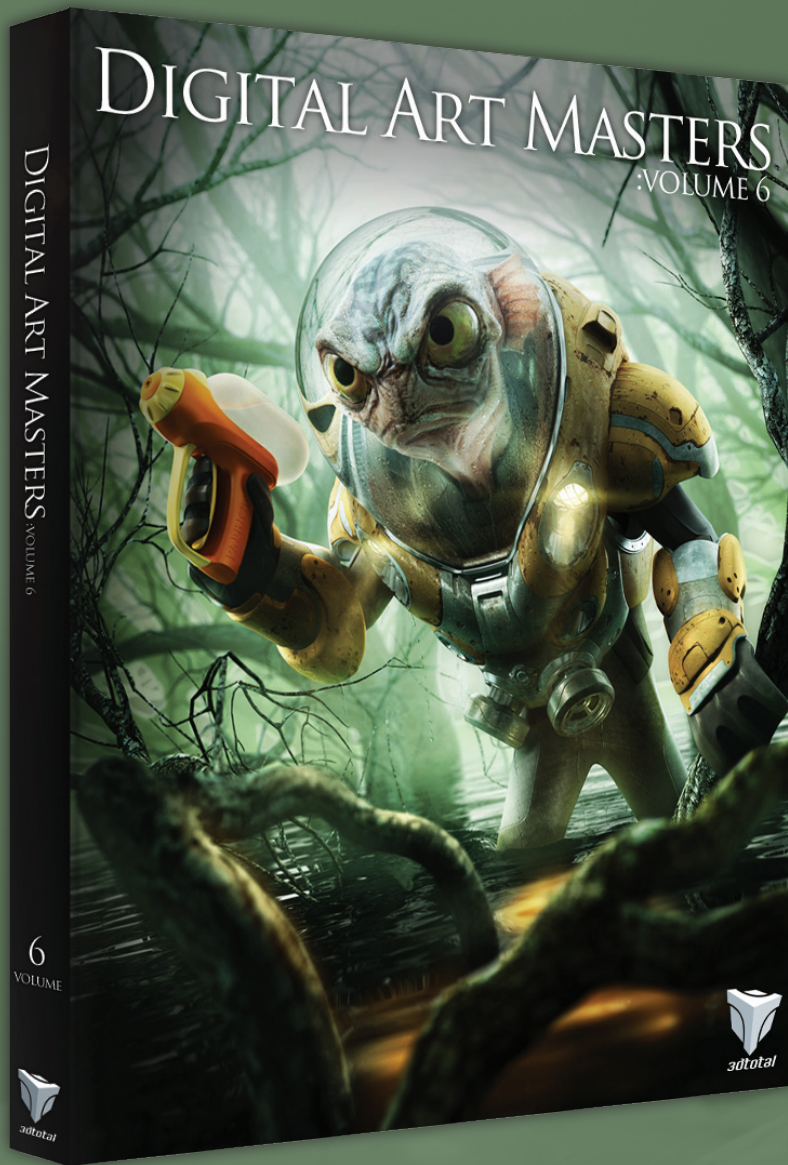
ZBrush has quickly become an integral part of the 3D modeling industry. *ZBrush Character Sculpting: Volume 1* examines the tools on offer in this ground-breaking software, as well as presenting complete projects and discussing how ZSpheres make a great starting point for modeling. Drawing on the traditional roots of classical sculpture, this book also investigates how these teachings can be successfully applied to the 3D medium to create jaw-dropping sculpts.

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This month we feature:

"LADYBUG"

BY ANDRZEJ SYKUT





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LADYBUG

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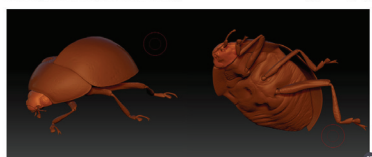
JOB TITLE: Freelancer
SOFTWARE USED: 3ds Max, Wings 3D, ZBrush, Photoshop, After Effects



INTRODUCTION
Ladybug is something of a happy accident. I made the bug model for another project, where it was just one of many pieces. Nevertheless, just to be sure, I made it detailed enough so it would look good on its own. I had the time and will to put in the extra work so I thought, why not? As an afterthought, I considered composing a portrait of just the bug as it is nicely detailed and that is how this image evolved.

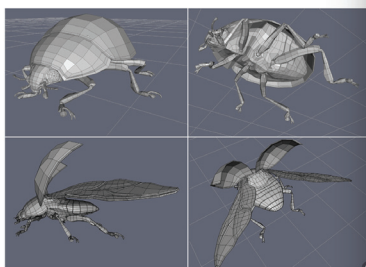
MODELING

For a model such as this, gathering references is crucial. I don't simply mean one or two images, but rather a whole library. A ladybug seems like a simple shape to model, but it has a lot of hidden details and unless you know how it's structured and how it works, you'll have a hard time getting it to look right. Fortunately, with Google image search and Flickr, it was easy to quickly amass a large library of photos from numerous angles. As a result a few things became apparent. First were the inner wings and the way they fold away under the spotted, red outer covers (which also happen to be wings), opening and rotating in a specific way. Next was the body, which from a side view is not straight, but follows a shallow curve with the "midsection" being higher than the head and the rear. Due to a lowered, flattened rear, the inner wings have a cavity to fold into. Following



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TITLE OF SECTION



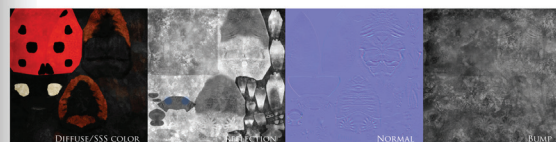
on from this were the details concerning legs, mouth apparatus, mandibles, coloring, etc...

Having established the basic "bug layout", I started modeling the base mesh. I used Wings 3D for the principal modeling and UVs. ZBrush for sculpting, and 3ds Max for everything else. As per usual, I started with a Box, subdivided it, applied Virtual Mirror and proceeded with some cutting, shaping and transforming etc. It's pretty straightforward because what matters most in this case is the main shape, silhouette, roundness and simple edge loop structure, as opposed to the details. Of course, I could have modeled more detail at this stage, but sculpting

them is faster. I devoted most of my time to the legs and all those antennae, of which many sections were duplicated. However they all needed to be tweaked individually as each leg or mandible required separate UV coordinates (Fig.01).

Speaking of UVs, I used Wings 3D Auto UV to unfold all of the components and Max to tweak the final layout. Tweaking and moving UV shells, especially when there are a lot of them, is faster to do in Max. None of the UVs overlap because ZBrush doesn't appreciate this. In other words, it crashes during displacement generation, causing unnecessary stress to the user, apart from which clean UVs are always advisable. I started with size-normalized UVs and tweaked their relative sizes based on the importance/visibility of the various body parts. It was then time to move onto the sculpting.

The sculpting part is usually fun, and this was no exception. Most of the detail is on the underbelly/legs area and not so much on the top, which is made up of a hard, smooth shell. The underbelly is a concoction of numerous creases, recessions and segments for which I



mainly used the DAM Standard, Rake, hPolish, and FormSoft brushes, to name a few. Most of that detail is not visible as it turns out, nevertheless it was fun to make and maybe someday I'll compose another image where it may come in handy. After completing the sculpting phase I generated Displacement, Normal, and Cavity maps in readiness for the texturing (Fig.02).

TEXTURING AND RENDERING

The diffuse texture is a combination of flat base colors, overlaid with assorted grunge/detail maps, supported by modified Cavity/Displacement maps, and refined with some painting. Reflection, Glossiness and Bump

maps were derived from tweaking the layers making up the diffuse texture and altering or inverting the color and intensity of them. The textures were tweaked repeatedly during the shading process as it's hard to get them right on the first attempt (Fig.03).

For shading and rendering I used 3ds Max and V-Ray. Taking a cue from the reference images, I wanted the bug to be slightly translucent as well as appearing shiny. To achieve this I used a V-Ray FastSSS2 material, with Raytraced reflections and Refractive Scattering. It's probably one of the most intensive approaches, but it still rendered in a reasonable time. Something worth mentioning here is the issue

of scale. It's generally a good idea to keep things to a real-world scale, but there are things to consider. With the bug sized accordingly (5-10mm or so), working with bones for rigging would be uncomfortable. To make the rigger's life easier, I scaled it up to roughly 5-10cm.

Tip: Reset the X-Form to "bake" the scaling transformations, which helps avoid any consequent frustration. Bearing this in mind, I tweaked the SSS Radius and Scale parameters until things looked correct (Fig.04).

At some point I added the tiny hairs, mostly along the legs. They were done using the Hair & Fur modifier and share the same material as the object they are attached to and are therefore nicely translucent. I also added some fur to the leaves, hoping to blur them when adding the Depth of Field during the post work.

Next the model went off to be rigged and animated, and to fulfill its primary purpose. It was quite satisfying, since I got to finally light and render it too.

A few weeks later, during a bit of downtime from work, I started assembling this image. I started by setting up a camera angle. I then proceeded by adding some leaves, tweaking the camera a bit, adding more leaves, and a little more tweaking. All in all, it was pretty simple. The dew droplets proved to be somewhat more problematic. I employed two methods to place them, the first being Scatter which was used for the smaller drops on the leaves and hair. The larger, flattened ones were placed using the Advanced Painter script, and tweaked manually thereafter. It was time-consuming to tweak the arrangement without disrupting the composition. Getting them to look right was another matter, which involved



TITLE OF SECTION

49

The following shots of the "Ladybug" book pages are featured here in full-resolution and can be read by zooming in...

caustics and therefore a degree of trial and error where the settings were concerned. Those nice bright spots under the drops – that's caustics.

LIGHTING

The scene is lit by a few large V-Ray Area lights and a HDR environment map. There's also a HDR map used to reflect an environment. The trick here is to use a low res (diffusely convoluted) version of the map for lighting, and a high res one for the reflections. That way Global Illumination is faster, smoother and contains less noise. sIBL is a great little app to generate (among other things) the convoluted version of any HDR map. HDR Shop is also effective and some maps can be bought or downloaded ready-prepared.

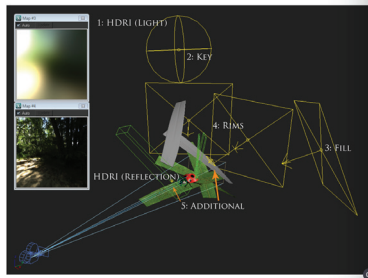
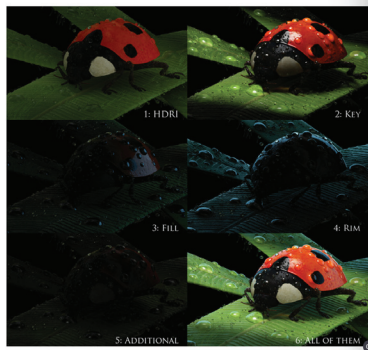
The lights themselves consist of a large, warm Spherical key light (to represent the sun) and a few blueish Rectangular Area lights, acting as fill and rim lights, used to simulate the light from the sky. There are also two smaller, additional lights, highlighting certain parts like the head (Fig.05).

In addition to the lights, there are a few invisible, shadow-casting objects in the scene. They provide some shadows in the corners, acting as a natural vignette in order to focus the viewer's eye on the bug. They also occlude the reflected environment, creating the illusion of more leaves off-camera (Fig.06).

Apart from the caustics settings, all other rendering settings are straightforward. These included Exponential Color Mapping, a subtle Irradiance map (with lower settings for the final render), and DMC Sampling.

POST-PRODUCTION

The post-production was simple. I used After Effects coupled with a few plugins.



I added some Depth of Field to mimic macro photography together with a blurred background, some color correction, a vignette, some bright spots in the background (to add some depth), a bit of glare (with a subtle red and blue color shift), and a bit of Look Suite.

To enhance the "macro" quality, I added some chromatic aberration and a touch of grain. Despite being pretty simple and requiring no painting, the difference before and after is significant (Fig.07).

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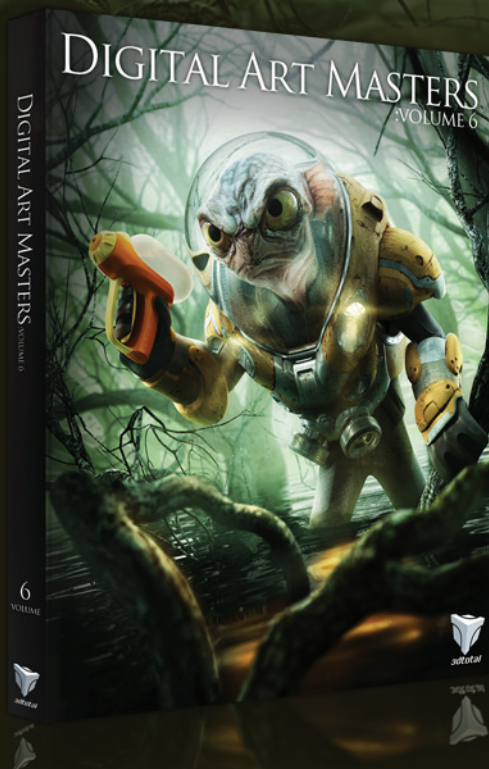
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Originally launched in 2005, the annual Digital Art Masters series continues to showcase the work of some of the finest 2D and 3D artists from around the world. The latest volume, Digital Art Masters: Volume 6 is our biggest book yet. It welcomes another 50 up and-coming and veteran artists, and follows the tradition of taking readers beyond the breathtaking images with detailed breakdowns of the techniques and tricks each artist employed while creating their stunning imagery. Inspirational and instructive, this is more than just a gallery or coffee table book, this is a timeless resource for any digital artist. The special hardcover edition is only available to purchase from www.3dtotal.com/shop

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Is a resource website for the CG community; amongst our growing number of products for CG artists, we produce two monthly downloadable PDF magazines – 2DArtist and 3DCreative.

We are based in the West Midlands, in the UK, and our intention with our magazines is to make each issue as full of great articles, images, interviews and tutorials as possible. If you would like more information on 3DTotal or our magazines, or if you have a question for one of our team, please use the links below.

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If you have a CG community website and would like to support 3DCreative and/or 2DArtist magazine by showing our banners, please contact Lynette Clee at the email address above

